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Coffeemaker Too

Sir:

Allow me to add a few words to the thousands already reverberating around the readyrooms of multi-engine squadrons, both before and after "Coffeemaker's" comments of June, 1958.

While in the fleet, I served in two multi-engine squadrons, under three CO's. Let us briefly compare them.

a. Fresh from Hutchinson, I was told by my first CO: "Glad to have you aboard, Ensign Zilch; I'm sorry that we will be unable to check you out in the aircraft, but we hope that you will be a very good navigator." This CDR backed up his words by not checking out in the aircraft himself during his entire tour as CO! The second CO passed the word that everybody would fam in the airplane, and insured that his policy was carried out. Soon we had several LTJG plane commanders, an equal division of flight time, and exceptionally high morale, though it should be noted that this program was opposed by the "old guard" from the start, and only the fact that the skipper was an outstanding naval officer prevented them from pigeonholing his policy.

b. Shortly after making plane commander, I was transferred to a PATRON. With only twelve airplanes and over fifty pilots, we had more than enough coffeemakers. The usual platitudes were uttered periodically to calm the more rebellious JO's, but fam hops for them were practically never given until an actual vacancy occurred. Cross-country flights, even under VFR conditions, were not approved unless a plane commander was aboard; since most PPC's were senior and/or married, hence uninterested in cross-country flights, this one remaining avenue for junior pilot training was effectively closed. It was not at all unusual

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Letters

for an ENS or LTJG on a patrol to be credited with several hours pilot time, even with a landing, when he had never moved forward of the nav table. This could count heavily against him if he ever did fam (unless he was quite above average) since his "Scheaffer time" was always several times his experience.

There are certain ways of alleviating this situation, which is common to most multi-engine squadrons, including the following:

a. Concentrated effort by the JO's to learn all they can, gathering experience whenever possible, even though the command seems apathetic — if not downright antipathetic — towards his training. How many of the "Coffeemaker's" friends go to the squadron before quarters to make an engine runup with the plane captain, or have stayed after secure to copilot a test hop? And very few "Coffeemakers" have completed their pilot's exam . . .

b. Less of the attitude: "I navigated when I was an ensign!" so prevalent among "iron pants" plane commanders.

c. Command insistence that senior officers qualify as completely as any junior officer in the fam syllabus. Too often are corners cut to permit a LCDR, only partially qualified, to take command of a crew, while the same corners are made deliberate obstacles for a LTJG.

As long as the Navy continues to place three or more pilots in a plane designed for one or two, this will be a recurring problem. Basically, there is only one solution, and that is a positive policy by a good CO who is determined that all pilots in his squadron shall be given at least the opportunity to fly the airplane, and, if qualified for command of that airplane, the opportunity to exercise that command.

LOW MAN

Single Engine Record

Sir:

In April 1958 ATU-102 was disestablished . . . with 40,182.2 continuous accident-free hours, of which 16,043.2 were flown between 1 July 1957 and 11 April 1958 . . . the Unit is no longer eligible for safety awards, but former members are intensely proud of this accomplishment and would like to know if this is a single engine record.

CDR J. W. LORCH, USN
former O-in-C, ATU-102

● Without committing our records and statistics people to several nights of overtime, it appears that your hours are a record, subject to challenge by other much-safe-flying outfits. Our limited facilities must necessarily be devoted to accident analysis.

Help

Sir:

. . . Our squadron is a bit discouraged at endorsers' comments to our AARs. Unable or unwilling to comment on the findings and recommendations of our investigations, they resort to comma hunting, and administrative nitpicking.

We do try hard to prevent accidents, and when we do have one, to learn the most out of them.

These tactics kill our board's spirit. . .

SAFETY OFFICER

APPROACH welcomes letters from its readers. All letters should be signed though names will be withheld on request. Address: APPROACH Editor, U. S. Naval Aviation Safety Center, NAS Norfolk, Va. Views expressed are those of the writers and do not imply endorsement by the U.S. Naval Aviation Safety Center.

● It is unfortunate if endorsers either are unable to add to the meat of the subject, or avoid it. But this doesn't happen too often. And in defense of so-called nitpicking, it must be said that endorsers, the Bureau of Aeronautics, and the Safety Center have nothing to go on but the big and little details of the AAR. Even a small inaccuracy can foul up an IBM run, thus invalidating to some extent the results of important safety research.

Speechless Drill

Sir:

I have recently read your edition of March 1958; on page 18 is the letter "CLICK CLICK," which I found particularly interesting.

For some years now there has existed a standard procedure both in the Royal Navy and Royal Air Force for dealing with this sort of situation. It is known as "SPEECHLESS" and has on a number of occasions enabled aircraft to be recovered in I.M.C. (IFR) when they had lost the voice modulation of their transmitter.

Under these conditions it is possible for a normal landing and controlled descent through cloud to be accomplished. The drill to be used by the pilot and the control officer is as follows:—Symbols are to be transmitted by the pilot pressing his "Press to Transmit" button.

Pilot: Transmits letter H at five second intervals on voice net in use.

Control: On hearing four dots,

(i) Immediately sets CRDF (Communications Radio Direction Finder) watch on that frequency

(ii) Allocates call sign "Speechless 1, 2 or 3, etc" to aircraft

(iii) Orders "Steer . . . for base"

(iv) Gives required pressure setting

(v) Orders quadrantal height

Continued from preceding page

"1.9 in 1959"

to be flown

(vi) Requests other required information

Pilot's Code:

One dot—Yes or Understood
Two dots—No
Three dots—Say again
Two second dash—Turn complete, steady on heading, visual, . . .

Other pilots on hearing the call-sign "Speechless" being used are to reduce voice signals on that frequency to an absolute minimum, until it is known that the "Speechless" aircraft has landed safely. Speechless drill may be used for obtaining assistance from the International Distress and Emergency Organization.

D. H. MERRIN, LCDR, R.N.
Senior Air Traffic Control Officer
R. N. A. S. Lossiemouth

Pomola

Sir:

A few comments about the POMOLA diagram in "Crossfeed" a few months ago. I constructed one and installed it for a cost of $28. I believe that a few changes are necessary on the diagram:

First—Because plywood comes in four-foot-wide sheets I made the three panels four feet wide. This gives better visibility and saves having to cut a foot off the width of the plywood sheet which foot is just scrap after it is cut off anyway.

Second—I made the stripe one foot wide in black paint to improve visibility.

Third—The five-foot distance between the two front panels is not enough. I have now changed mine to eight feet and am testing it for visibility.

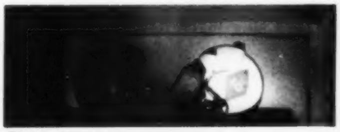
Fourth—The 15-degree angle to the runway is too great. It could be installed with no angle provided the back panel is offset from directly centered behind the two front panels to a position to one side or the other depending upon which side the approach is made. This back panel must be placed so that during the approach it is behind and between the front two panels as seen by the pilot. The 15-degree angle definitely does not do this.

Fifth—A high visibility type paint is a must. If you can do it, I would certainly appreciate a new set of plans of a POMOLA which has been installed and found to be satisfactory. Maybe mine will be okay if I can get some technical help to measure angles and level the panels.

E. J. ADAMS, LCDR.
NAS Glynco
Brunswick, Ga.

● **APPROACH and Crossfeed would like other comments and criticisms on POMOLA, including photos and plans.**

Now See This



Sir:

. . . the enclosed photo clearly shows the high reflectivity obtained by covering a hard-hat with white and green "Scotch-lite" . . . the standard gold-colored hat is on the left, and the background is white enamel paint. We've found that the tape is practically chip-proof and scratchproof . . . available in a variety of colors and sizes.

H. BROADBENT, JR.
Acting CO
VA-195

● **Please see "Hardhat Paint," page 36.**

RELIABILITY vs. COMPLEXITY

In the field of military aviation, ordinarily complexity is inversely related to reliability—make a device more complex, and it's usually less reliable. And a complete aircraft or system can be no more reliable than its least reliable component.

Unfortunately, we'll never have an aircraft as simple as the one sketched here for today's tactical and technical requirements make it mandatory that we accept a certain degree of complexity.

Manufacturers are aware of the need for better reliability on one hand, and of the necessity for greater complexity on the other hand.

How can we achieve reliable complicated equipment, if reliable simple equipment is unattainable?

That will be the subject under discussion at the second annual Navy/Aircraft Industry Conference on Aeronautical Material Reliability, which takes place the 5th and 6th of this month at the Hotel Cavalier, Virginia Beach, Va.

The conference will be addressed by recognized authorities in the field, and has as its goal the achievement of greater fleet readiness by bringing the user's experience to the attention of the manufacturer through more complete, thorough and objective reporting. It is hoped that the maintenance and reliability data thus provided to manufacturers will enable them to design and produce components with a greater built-in reliability.

Theme of the conference is, "Challenging the Weapons System Complexity Barrier"; the highlight address will be given by VADM Robert B. Pirie, DCNO (Air), who will speak on "Material Reliability and Operational Readiness." The conference is being sponsored jointly by the Chief of the Bureau of Aeronautics and the Commander, Naval Aviation Center.

Destroyers have successfully rescued at least 49 downed aviators and aircrewmen from 32 ditchings in the 18-month period ending 1 July 1958.

One of the most frequent statements by destroyer-rescued pilots is, "I did not have any idea of how the destroyer would go about rescuing me!" As a result of this and to further apprise both aviators and destroyer personnel of some of the mutual problems in this complex area of operations, APPROACH has prepared this original article. It has been coordinated with appropriate sources, some of which are noted at the end of the article.

During the preparation of the material, it was independently suggested by ComDesLant that NASC and that command undertake jointly a project of developing procedures and devices to effect rescue of men in the water by the most expeditious means. When this project is complete, APPROACH will report the details.

In the meanwhile, it should be emphasized that the following article contains the best information available to APPROACH at the moment and is informative and not directive in nature.

Continued from preceding page

Drawing from Navy Combat Art Collection by Hugh Cabot III, JOSN, USN.

QUICK PICK-UP

"Gamebird Tower, this is Gamebird Seven-Three turning downwind. Wheels down and locked. Tailhook down. Lights set up for landing. Over."

"Gamebird Seven-Three, this is Gamebird Tower. You are cleared for your downwind turn. Over."

"Seven-Three. Roger. Out."

"Gamebird Tower, this is Seven-Three. My engine is cutting out."

"Roger, Seven-Three, this is Gamebird Tower. Can you make it to the ship? If so we will clear the pattern and you have an immediate CHARLIE."

"Negative, Tower. My engine is cutting out too much. I am going in."

"Roger, Seven-Three. We will keep you in sight and notify destroyers."

Retracting the wheels of the AD-5N, the pilot held 100 knots IAS until impact. When he hit, a great "wall of water" engulfed the plane. Manually opening his canopy, he climbed out onto the wing, inflated his life vest and

Rescues at sea are at best difficult. When injuries and ensnarled parachutes are mixed, as in this case, it is even more important that all possible procedures and alternates are fully understood.

stepped into the water. The sea state was heavy and the aircraft sank in approximately 90 seconds. The time was 2200.

As soon as he was in the water, the pilot turned his life vest flashlight on. The first signal flare he tried to ignite did not work and although the second flare worked satisfactorily, the high sea state reduced its visibility. Loading his .38 revolver with tracer ammunition, he fired six rounds at 10-second intervals.

From the crests of the swells he could see the running lights of the search ships and was confident that his tracer bullets had been observed. After reloading his revolver, he inflated his life raft and climbed into it.

By this time, a destroyer was approaching. The pilot fired two more tracers to make certain the ship could locate his position. As the destroyer drew closer, he directed the beam of his life vest flashlight toward it. The DD turned its spotlights on him and, rapidly coming alongside, put lines over.

When one of a number of lines thrown to the pilot fell near him, he left his life raft and swam toward it. He was then pulled amidships and up a cargo net over the side. Swimmers were in the water to assist him.

Two Mistakes Made by the Pilot

(The Aircraft Accident Board later noted in its report that the pilot made two mistakes: 1) He concentrated so heavily on signalling that he failed to climb into his life raft as soon as he might have. 2) He would have been wiser to remain in his raft until definitely alongside the destroyer.)

In his report of the accident, the pilot paid high tribute to the

Continued from preceding page

One of the most frequent statements by rescued personnel is "I didn't have any idea of how the destroyer would go about rescuing me!"

destroyer: "The rescue was effected very efficiently and expeditiously and the officers and men of the destroyer deserve credit for an outstanding job of seamanship."

Among the pilot's comments in the AAR (Aircraft Accident Report, OpNav 3750.6C) is one very significant statement—he reports that he did not have any idea how the destroyer would go about rescuing him. For other flying personnel who may find themselves in the same situation, here are some facts and authentic cases on plane guard destroyer rescue work.

Destroyers and destroyer escorts have two functions when on plane guard—they stand by to assist in case of an accident and also serve as a reference point for pilots to gage their turns. Especially at night, a number of

"Facts About Rescue at Sea," *Destroyerman*, August, 1957

Recent fatalities in rescue efforts of pilots downed at sea in carrier operations brings to light some salient facts that are of interest to everyone in the Destroyer Force.

First the routine use of helicopters on plane guard stations and their repeated successful pick-ups under difficult conditions have perhaps lulled everyone into a false sense of security concerning rescue of downed pilots. There is no question of the sense of responsibility of the "Angel" crews and pilots, nor their dedication to their task, but to retain a conscious, or unconscious, belief that they will always effect a pick-up successfully is a fallacy.

There is presently a real concern on the part of helicopter units that the new integral harness flight gear and the present helicopter rescue equipment is incompatible. This stems from the fact that the integrated type mae west prevents normal entry into the helicopter rescue sling. This new integral harness is now being used in the A4D and F8U . . . and will be backfitted into other aircraft. (Editor's Note: Since this article was written the integrated torso harness is also being used in some models of the A3D and is scheduled for coming aircraft including the F4H, P6M, TT-1, T2-J and A3J.)

The concern of the helicopter crews can be best shown by an excerpt from recent correspondence of Helicopter Utility Squadron TWO, as follows: "stress doctrine that DD should assume helicopter rescue will be *unsuccessful* until helicopter is back on carrier deck" (with all crew and rescuee).

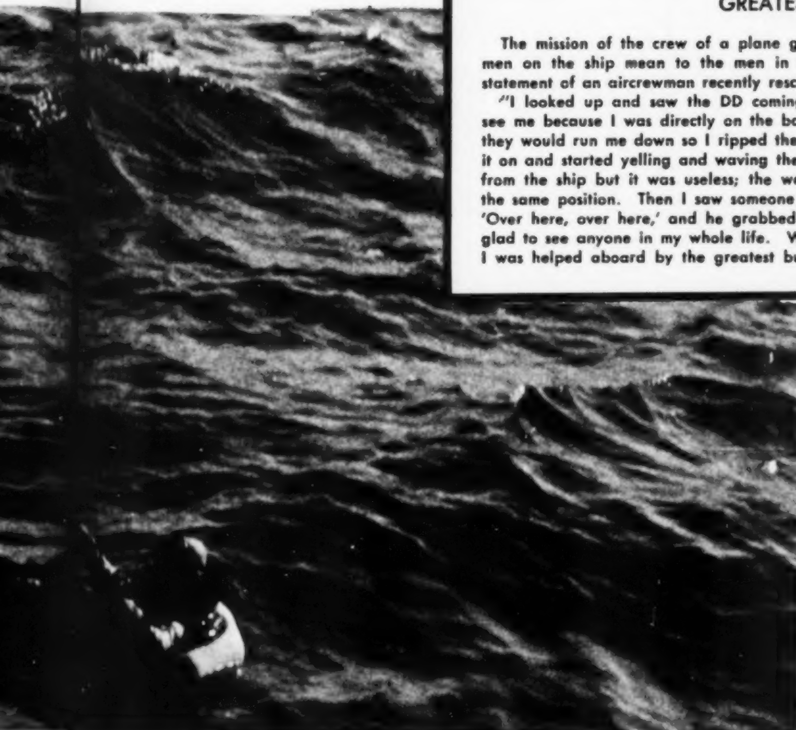
This correspondence further stated that "The helicopter can *positively* effect a rescue only if the rescuee is capable of helping himself into the sling.

"This requires moderate sea conditions, an uninjured pilot, a lack of complicating factors, such as a deployed parachute, or bulky flight or survival gear which prevents sling entry. Under these ideal conditions, the helicopter can be considered a primary rescue device." (Emphasis provided by DESTROYERMAN.)

GREATEST GUYS

The mission of the crew of a plane guard vessel is life and death. What the men on the ship mean to the men in the water is dramatically evident in the statement of an aircrewman recently rescued by a plane guard destroyer:

"I looked up and saw the DD coming straight for me. I thought they didn't see me because I was directly on the bow. I started to get panicky and thought they would run me down so I ripped the flashlight off of my mae west and turned it on and started yelling and waving the light frantically. I tried swimming away from the ship but it was useless; the water and swells kept pushing me back to the same position. Then I saw someone about five feet away from me. I yelled, 'Over here, over here,' and he grabbed me and I grabbed him. I was never so glad to see anyone in my whole life. We were pulled to the side of the DD and I was helped aboard by the greatest bunch of guys I have ever seen."



Under conditions other than those above, who then becomes the primary rescue agency? Right! The destroyerman! To make an accurate evaluation of whether the conditions are other than as described above, the destroyerman should take every opportunity to acquaint himself with the capabilities and limitations of helicopters in rescue operations. The helicopter squadrons have indicated that they will furnish any or all with whatever information is desired by direct liaison.

A few tips that the helicopter squadrons forward for increasing probability of successful rescue at sea are as follows: Communications between plane guard DD and carrier on land/launch frequency should be checked prior to any flight operation and again checked with helicopter after launch. Land/launch frequency should be available at the bridge of the DD in order to enable the DD to vector the helicopter, as necessary, when a helicopter crewman is in the water and the helicopter pilot is holding upwind from rescuee/crewman in the water. Qualified swimmers should be standing by on the DD and boat in the water, or immediately available.

The destroyer should proceed to the proximity (about 150 yards) of the helicopter, preferably to port and slightly downwind, which will place the destroyer within range of vision of the pilot and will permit an approach upwind toward the rescuee should the destroyer assume the responsibility.

Helicopter Utility Squadron TWO recommends that all hands who may be involved in rescues-at-sea, particularly those connected with carrier operations, re-evaluate their present concept of helicopter rescue operations and, where necessary, adjust this attitude to the fact that the helicopter is not the ONLY rescue vehicle.

It is also strongly recommended that all hands re-acquaint themselves with the applicable ComDesLant 5400 series instructions under the section "Man Overboard Bill" and make sure that the spirit and the letter of this instruction are followed.—DESTROYERMAN, Aug. '57, pg. 3-4

ships may be assigned plane guard stations to establish a visual horizon for the pilot by their trucklights.

The primary plane guard station is the one on the quarter of the carrier, usually 165° relative, 1000 yards. This distance allows the destroyer ample room to stop before running past any crash occurring near the carrier. The station is slightly on the quarter to allow the destroyer's bridge personel to see across the bow of the carrier in case a plane goes in over the bow. It also moves the plane guard out of the landing pattern.

Plane guard stations to be manned and speeds to be maintained are determined by the officer in tactical command, who delegates to the screen commander the assignment of specific ships to plane guard stations. These destroyers and destroyer escorts are plane guards only when carriers are launching or recovering aircraft; otherwise, they are part of the screen.

What the Ideal Set-Up Includes

Ideally, the set-up aboard a vessel on plane guard station should include 1) alert, well-trained lookout and topside watch teams, 2) routine tracking of each aircraft within radar range; and 3) complete mutual understanding of SAR techniques and facilities. Personnelwise, smooth plane guard work depends on good lifeboat and deck rescue de-

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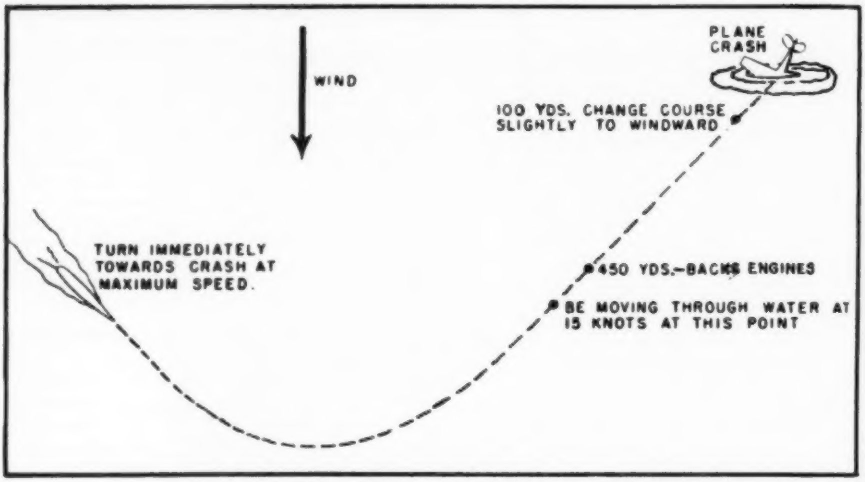

Figure 1. Maneuver for a plane crash.

Illustration: Courtesy of Crenshaw, "Naval Shiphandling," Naval Institute, 1955

tails topside during flight operations; swimmers ready to go into action to assist injured, exhausted or unconscious survivors; reliable men to man the nets; sharp-eyed responsible lookouts and an experienced boat crew with smooth-functioning equipment.

Should any pilot find himself in trouble, PriFly or CIC and the carrier bridge are notified and the OTC directs the rescue.

According to NWP 37, when an incident occurs in the vicinity of the task group formation, the rescue destroyer or helicopter or both proceed to rescue the personnel without further orders. If the rescue destroyer reaches the scene prior to the helicopter, the commanding officer of the destroyer conducts the rescue and the helicopter proceeds as directed by him. If the helicopter is the first to reach the scene the helicopter pilot conducts the rescue and the destroyer proceeds as directed from the helicopter.

Two Primary Ways of Rescue

Basically, the plane guard vessel effects the rescue in one of two ways: 1) by the direct approach to the man in the water, or, 2) by circling to pick him up in a maneuver called the Williamson Turn.

In either case, the conning officer informs CIC of the plane crash and stations a man on the pelorous to give continuous bearings to the scene of the crash. CIC shifts the Dead Reckoning Tracer to a 200 yards/inch scale and marks the scene with bearing information relayed from the bridge and range information from radar and/or range estimate from the conning officer. According to destroyermen, it is then an easy matter for CIC to advise the conning officer what courses to follow should the man be lost sight of since the DRT will show the path of the ship as it is maneuvered. In times of low visibility the DRT will be the conning officer's "eyes" in maneuvering to the scene of the crash.

(1) Direct Approach

If the survivor of the plane crash is in sight, the direct approach (Fig. 1) is used. The plane guard destroyer heads directly for the survivor at best speed. Five hundred yards away, the DD drops her speed so as to be making 15 knots through the water; with 450 yards to go, backs the engine in a manner to bring the ship dead in the water abreast of the survivor. About 100 yards away, the plane guard vessel changes course slightly to the windward to bring the survivor along the lee side. When the ship is dead in the water, it will drift downwind to the pilot.

A former destroyer skipper has this to say about the direct approach: "Direct pick-up could be the most frightening to the downed aviator. The destroyer would attempt to place its bow upwind from the survivor but close alongside him, the closer the better. In this regard, I can safely state the survivor has little to fear from the destroyer's running him down. *It is almost impossible to strike a small floating object with your bow even if you try.* Once the ship is stopped upwind of the survivor the wind will set the ship down to him. This, of course, aids in the recovery. The best advice I could give to persons who may have occasion to be recovered by a ship is to do everything possible to attract and hold the attention of the ship's personnel, which I'm sure is instinctive anyway, and to not attempt to change their

positions with respect to the ship as it approaches."

(2) Williamson Turn

If the survivor is not in sight (low visibility) or if conditions are such that it would be difficult to find him should the destroyer lose contact, the Williamson Turn (Fig. 2) may be the approach used. On completion of the Williamson Turn (which aviators can liken to a sort of low visibility approach maneuver) the destroyer is heading back along her initial track. This allows the plane guard to search carefully back along her former track until she locates the survivor in the water.

Once the survivor has been sighted and the plane guard vessel is nearby, he can be brought aboard in a number of ways. Determining factors are environmental operating conditions and weather.

ComDesLant Instruction 5000.1B states that "Ship recovery with rescue swimmer will be the primary means of recovery in man overboard. The motor whaleboat will be used to back up the rescue swimmer if weather permits." *(Ed's Note: Man overboard procedure as prescribed in the foregoing instruction is also the primary means of recovering downed pilots and aircrewmen.)*

ComCruDesPac has no official instruction regarding a preferred method of recovery. An informal report on the opinions of a number of ComDesCruPac personnel who have commanded destroyer type vessels states that "anyone in the water who is found by a destroyer can expect to be recovered by one of two methods, either by whaleboat or by direct pick-up from the ship." Swimmers are used to help where required.

Other Rescue Methods Available

Other methods of getting survivors on board ship are the boatswain's chair, rescue basket, Jacob's ladder, knotted line, trailing lines, heaving lines with ka-

BLIMP RESCUE

Among the most unique examples of destroyer rescue in the Naval Aviation Safety Center files is the case of the ZS2G-1 ditched because of fuel difficulties resulting in engine failure. When a whaleboat from the rescue destroyer could not catch up with the drifting airship, the DD was maneuvered into position and took the blimp's bowlines in hand on the port quarter. The airship then vaned into the wind, slowed below the wind velocity and was forced into the side of the DD, making two large holes in the envelope. The DD whaleboat took four crewmen off the blimp. The loss of the weight of the crewmen plus continued fuel loss caused the blimp to again become airborne. The remaining crewmembers disembarked into the whaleboat and were taken to the destroyer. Salvage was abandoned when the blimp's envelope ripped around its circumference and it began to sink. The tail section was sunk by destroyer gunfire.

Personnel from the blimp were high in their praise of the DD smallboat crew who performed the rescue in spite of the fact that they had to maneuver through water with gasoline floating on the surface. The blimp copilot described the boat crew's actions as "courageous." He also noted that the fact that a fire did not start was "remarkable."

Illustration: Courtesy of Crenshaw, "Naval Shiphandling," Naval Institute, 1955

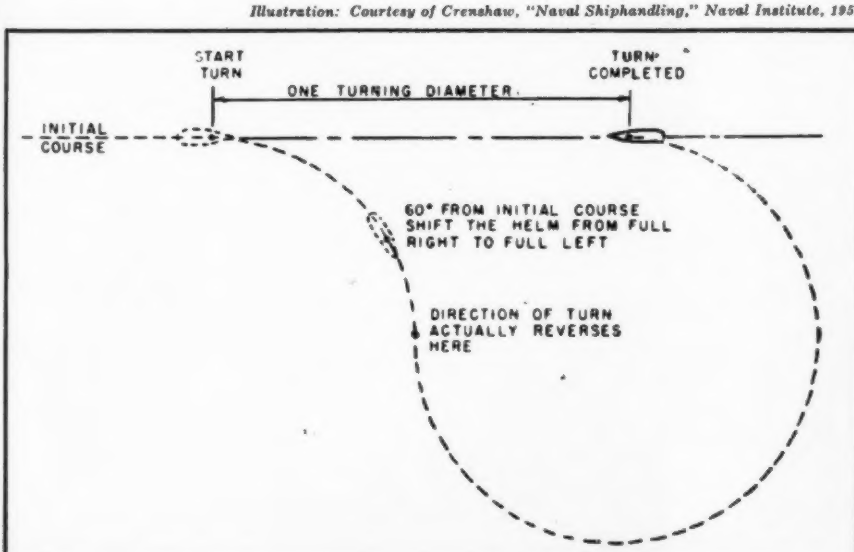

Figure 2. The "Williamson Turn."

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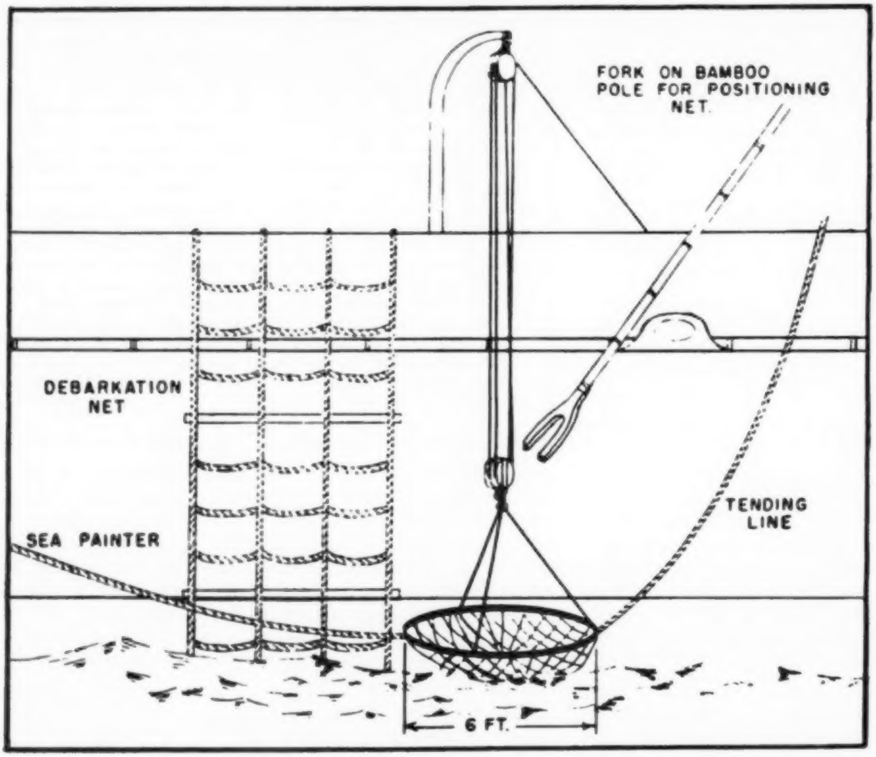


Figure 3. The survivor rescue basket.

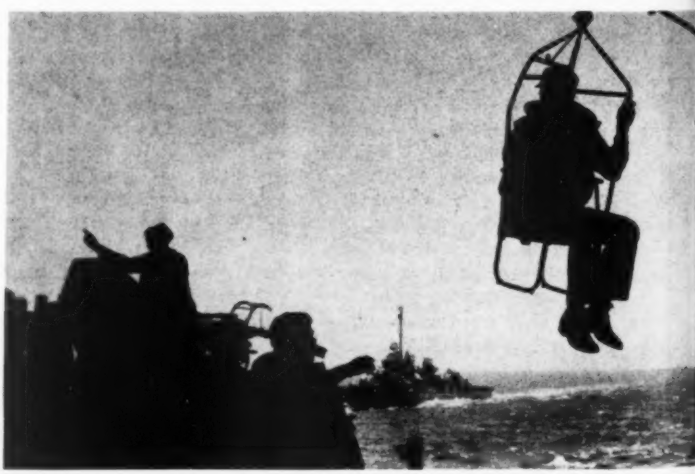
Illustration: Courtesy of Crenshaw, "Naval Shiphandling," Naval Institute, 1955

pok "monkey fists," line with a life ring or harness attached, lifeline to be fastened or snapped to the life vest hoist strap, small boats and cargo or debarkation nets over the side with swimmers in the water to assist the survivors.

The rescue basket (see Figure 3) is a relatively new development in survivor recovery. The problem of getting an exhausted, unconscious or injured survivor aboard ship in a rough sea has always been difficult but the rescue basket can offer a solution. Essentially, it is a shallow net about six feet across that can be lowered into the water so the survivor can climb or be assisted into it for hoisting aboard. It is swung from a small davit amidships and when used in conjunction with good swimmers on safety lines it should offer the solution under almost any conditions.

Another means of getting incapacitated survivors to the deck is the boatswain's chair. After

Rescued by plane guard destroyer, a pilot is returned to his carrier by high line.



the chair has been lowered to the water a rescue swimmer assists the survivor into it and fastens him in by means of a belt or snap-hook line.

Nets Over the Side

When a plane guard is taking survivors aboard by cargo net or debarkation net, the net is lowered 5 to 6 feet into the water with fenders in position to keep it clear of the ship so it can be grasped. Swimmers, wearing life preservers and secured to the ship with safety lines, assist the survivors. Experience has shown that if a survivor is suffering from injury or exposure *as many as five men may be needed* to help him up the net and onto the deck.

A rescue swimmer from a destroyer swims to the aid of an incapacitated pilot.

Sometimes a line with a bowline loop in one end is passed down to a rescue swimmer from the ship. The swimmer puts it around the survivor's chest like a helicopter sling or ties it to the hoist strap of the survivor's MkII life vest if the life vest waist band is buckled. If the survivor is wearing a torso harness, the line should be slipped under the harness where it goes across the shoulder, then tied.

A Combination of Methods

A combination of methods was used to rescue the pilot and two crewmen of a ditched AD5N.

Here's how one of the crewmen described it:

" . . . I started yelling. I thought the DD would not see me. They came on us with a good number of spotlights searching the water for us. I was on the port side of the ship and began waving my arms and yelling to them. As they came closer, they turned off their lights and threw me a life ring. It was about 10 feet away and I tried to swim to it, but the swells of the water would push it farther away. I finally reached it and hung on. Then one of the men off the destroyer dove in and pulled me to the side of the ship. They had a cargo net over the side but I didn't have any strength left to climb it; I could only cling to it. They tied a line around me and pulled me aboard . . . We may have been in the water only a few minutes but it seemed like years."

Rescue by Stretchers

Stokes' stretchers with kapok lashed around the frame for buoyancy are sometimes used by plane guard destroyers to bring survivors on board. A line is secured to the stretcher at one end and after the survivor is strapped in, he is hoisted aboard in an upright position.

A ship on plane guard station when an F2H-4 pilot was rescued first tried using a stretcher to bring him on board but finally had to resort to lowering a boat.

This is the destroyer skipper's statement from the AAR in part:

"I slowed the ship and . . . backed full and placed the pilot about 30 feet from the starboard (leeward) side of the ship amidships. Swimmers went into the water and the pilot and raft were pulled alongside. A stretcher was put over the side to recover the pilot. At the time, the pilot seemed to be in much shock and pain. It did not appear easy to bring the pilot on board in the stretcher so the boat which had been placed at the rail earlier was lowered to the water . . . The pilot, raft and swimmers were brought aboard the boat (a few minutes later.)"

A stretcher was used successfully in the recovery of an injured pilot of an F2H-3 which

A Stokes' stretcher is used to bring the injured aboard.

Continued from preceding page

went over the side after a faulty night catapult launch.

The plane guard destroyer located the pilot in the water when he set off his first flare. The destroyer put its spotlight on him, but when the flare went out and heavy seas obscured the pilot from view, the destroyer lost sight of him. The ship steamed by within 20 yards of the pilot without seeing him. When the pilot's vest light would not work properly, he started blowing on his whistle and held up one arm to attract the ship's attention. As the destroyer steamed toward the sound of the whistle, the beam of the ship's searchlight picked up the pilot's upraised arm. The pilot was still blowing his whistle when he was rescued by the destroyer's small boat. (Later, the destroyer skipper told him that the sound of the whistle was the only way they had been able to relocate him.) When heavy seas made raising the small boat hazardous, destroyer personnel rigged a stretcher and hoisted the injured pilot aboard ship.

Rescue by Small Boat

Essentially, rescue by small boat or motor launch consists of pulling the survivors into the boat. If the survivors are injured or in a state of shock, members of the boat crew, wearing life preservers and attached to the rescue boat by safety line, go into the water to assist them. A complete list of equipment for the boat and assistance detail is in NWP 50, 7-29.

Regardless of the availability of helicopters, plane guard ships should have boats ready for lowering and boat crews on standby.

Chute Must Be Removed

To insure a successful rescue either by helicopter or destroyer, a survivor must first remove his parachute if physically possible. Whether opened or unopened, the chute can endanger both the survivor and the rescuer.

In the case of a helicopter rescue, the most important reason for not hoisting a pilot attached to his chute is the major hazard created by the updraft of a low-hovering copter's rotor wash which can cause the chute to be swept up and fouled in the rotor system.

An opened chute can entangle the survivor and the helicopter crewman, should he go in the water, or the swimmers from the rescue ship. An unopened chute is a potential danger because a chance movement by the survivor or rescuer or a blow from the copter rescue sling or other rescue equipment can actuate it. *Please see "Get Rid of that Chute," page 18.—Ed.*

In a case a few years ago, an open chute after preventing a helicopter rescue also thwarted destroyer rescue with fatal results. Acting as a sea anchor, the chute kept the unconscious pilot from drifting downwind of the plane guard destroyer standing by. A rescue swimmer on a line went over the side. The swimmer had the pilot in his grasp but the weight and force of the water-filled chute pulled both men under. The swimmer had to let go and the pilot passed under the bow of the ship. After appearing on the starboard side 15 to 20 feet below the surface, the pilot was lost although the search was continued until darkness fell. Prior to the time the pilot appeared on the starboard side, the destroyer had no information that he was still in his chute harness.

Successful rescue by motor whaleboat depends on an alert, well-trained boat crew ready to cope with rapidly changing conditions.

Signal Problems

In the case of an AJ-2 ditching, what might have been a destroyer rescue was finally performed by a helicopter when a destroyer underway 15 miles from the ditching point could not be diverted to the scene.

Two aircraft from a fighter squadron in the area were unable to attract the ship's attention either on UHF guard frequency or by flying across the ship's bow and rocking their wings along the course to the scene. The CO of the fighter squadron stated later that it was not known whether the destroyer saw any Emergency IFF but that it did not change its course or speed although the planes made repeated

Plane guard rescue work calls for close coordination between lookouts and bridge.

runs between the destroyer and the ditching aircraft.

"It is essential," the CO stated, "that all aircraft pilots and surface units be continually aware of the established visual or electronic emergency signals that may be received at any time . . . Indiscriminate 'buzzing,'" he further noted, "does a great deal to lessen effectiveness for such an emergency." [For refresher information on signals used by aircraft to divert a surface ship to the scene of an accident when radio signals are ineffective or radio silence is being observed, see NWP 37 (non-registered), SAR Manual.]

Good Communications Vital

In conclusion, a number of areas in plane guard rescue work seem to call for continual training and improvement, both on the part of the rescuers and rescuee.

Good communications at the scene of the rescue is a vital necessity in successful plane guard operations — communications between the rescue helicopter, the plane guard destroyer and the carrier. All three must be on the Land/Launch frequency to quickly and effectively handle emergency rescue situations. In addition, the small boat should be able to communicate with the helicopter and ships with semaphore or blinkerlights.

Equipment Needs Emphasized

Rescue equipment for use from aboard ship and the airman's survival and signalling equipment are fields for continued work and improvement by both designers and users. The plane guard's rescue equipment—small boat, lines, lighter marker buoys, etc. —should be the best and be in top working order. Perhaps some thought should be given to making frogmen suits and equipment available to rescue swimmers, especially for cold water operations.

The survivor has the responsibility to help save his own life by the proper care of, inspection of before flight, and use of his personal survival and signalling equipment—life vest, life raft, night flares, day smoke signals, flashlight, whistle, mirror, dye marker . . . The pilot mentioned first in this article strongly recommends that a .38 loaded with tracer ammunition be carried on all overwater hops, day or night.

And since the best equipment in the world is only as good as the use it is put to, continued emphasis on training is a vital necessity.

REFERENCES:

Crenshaw, "Naval Shiphandling," U. S. Naval Institute, 1955

ATP-1 (Registered, confidential)

NWIP 10-1 (Non-registered, confidential)

NWP-10 (Non-registered)

NWP-20 (Non-registered, confidential)

NWP-37 (Non-registered)

NWP-41 (Non-registered, confidential)

NWP-50 (Non-registered)

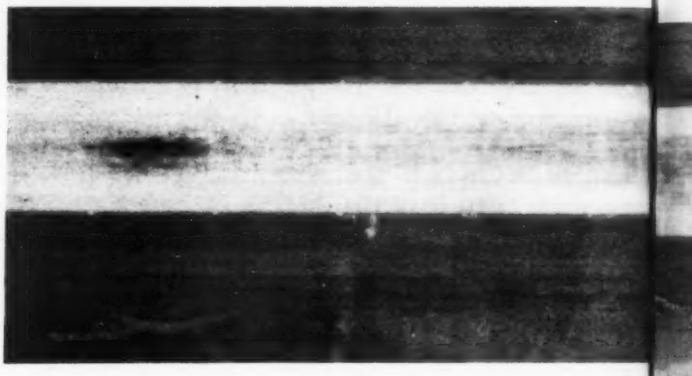
NavAer 00-80T-56

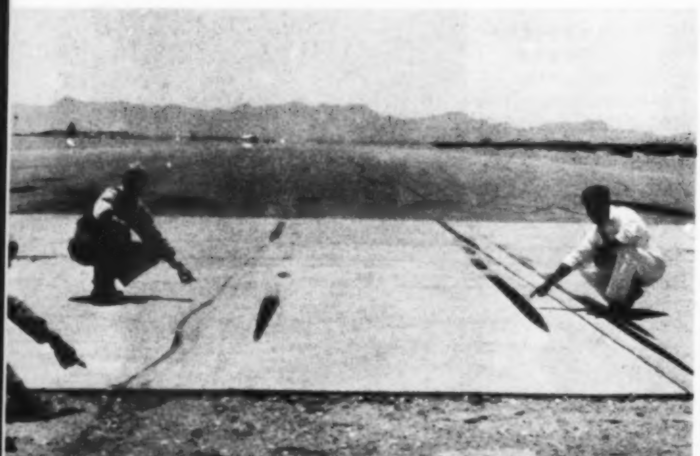
National SAR Plan developed and approved by the President's Air Coordinating Committee, 1 July 1956

Type Instructions and Ship's Organization and Regulations Manuals for Atlantic and Pacific Fleets.

"Landing short, struck runway lip, sheared main gear"—How often have you heard that before? Despite the cautions and admonitions, pilots continue to land short—*just a little short*—some unintentionally, and some to gain those extra feet of runway. And despite the standards, notices and instructions, many runways continue to bare an ugly, gear-crunching lip. Do your runway lips get inspected *regularly and frequently*, and get repaired expeditiously, or are they just getting

LIP SERVICE?

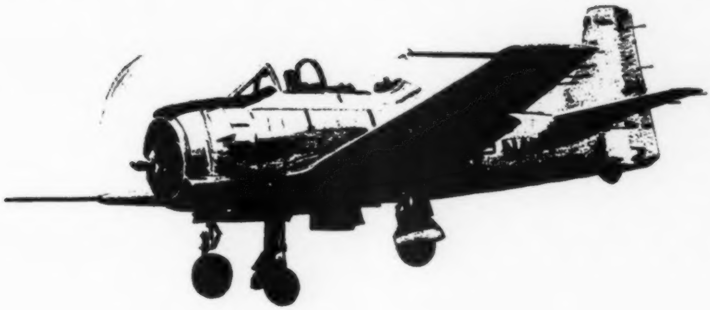




Some folks can play it mighty close and not get hurt, but when you use up all your tolerance, you're also using up all your skill—and all your luck. . . .

LIP service—you've heard the phrase before — we give lip service to lots of things in our daily lives. Like the Stop-Look-Listen signs at open country railroad crossings, for example—do you stop, look and listen, or do you give lip service to the rule by slowing down just a bit—maybe even tapping the brake so drivers behind can see your conscious effort? That's lip service—especially if you teach your youngster to heed the Stop-Look-Listen signs at open country railroad crossings.

What about that lip out at the end of the runway? Is it getting lip service literally, or figura-



Judging by the touchdown markings in the asphalt area overrun above, many pilots have developed a habit of treating the overrun routinely as "more runway." Besides being poor procedure, such practice can be acutely embarrassing in the case of poor "LIP SERVICE." *For a margin-of-safety pattern see picture, Page 17.*

tively? It's only four inches high, and pilots don't land short on that long runway—at least they aren't supposed to. Oh no? Well looky, here comes one now—ker-WHAMMO! That was a mightly expensive set of wheels he left behind as he slid along on his belly. And your cherry-picker is down for maintenance too—what a shame, now those low state *Demons* will have to use the shorter runway. . .

Let's consider for a moment, the biggest runway lip in existence—the CV round-down. Pilot lands a couple feet short on that runway and the spud locker becomes a mashed spuds locker—no margin for error there. There are some runways around the world that are almost as bad, carved out of mountain tops or terminating right at the high water mark of an island, but most every NAS/MCAS or AF base is built with a certain amount of reference to a Planning Standard, like BuAer Inst 11012.1A, which provides for end zones and crash (or splash) room at both ends.

The pilot, too, adds some land-short protection of his own, since he theoretically shoots for touchdown at some point X feet upwind of the runway end. He does this because he knows that there are many little variables affecting his landing, that he can't quite expect to touch down precisely at X feet, so that X feet is his margin for safety — if X is 1000 he can touch down 999 feet short and still land a whole airplane. But—if he touches down 1001 feet short of X, and the lip isn't in perfect shape, he's in the same pickle as the aerialist who misses the trapeze by a hair.

What should the pilot do then, to insure that he doesn't miss the trapeze? Shoot for 2X or 3X feet from the end? Well—just how long is that runway? Not as long as Edwards, or with a jog-and-keep-going like Cherry

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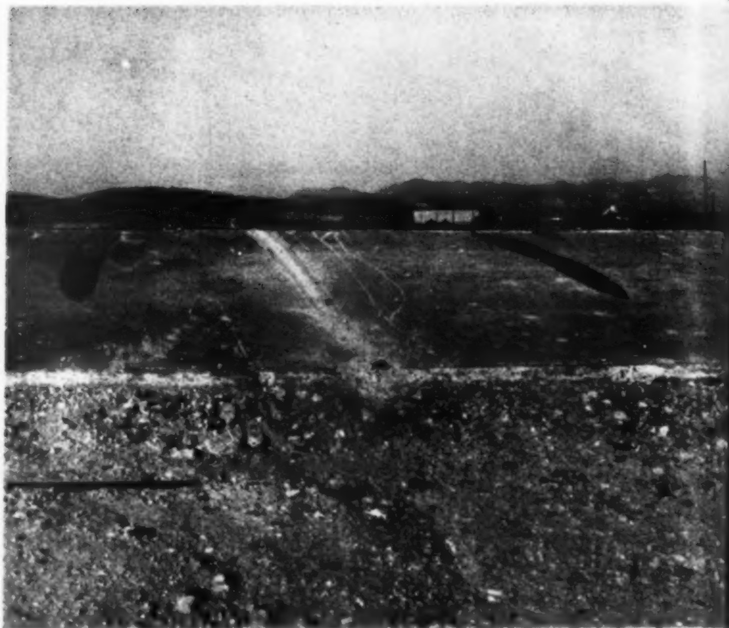


Ka-whump! Touchdowns in this end zone will get you 6 points—tires, oleos, main gear, pilot, maintenance gang, crash crews . . . mighty rough on 'em all.

Point. It's short enough so he has to shoot for that reasonable touchdown point which allows for normal variables and error, but not for compounded variables or error.

What can we do to help him? Aha! Provide him with an overrun which will serve as an underrun, mark it clearly and tell him, "That's an extra trapeze, in case you miss the first one, Tiger. It's money tucked under the mattress, don't spend it, just know it's there."

Fine, real fine, but what's the reaction of a standard type tiger with a tigress and a few cubs back at the lair? Natch, he adds the overrun (underrun) and says, "Hoo-hah, they've given me a longer runway, so now I will shoot for the runway end (I don't often miss by much) and have more concrete to slow down on. And if I undershoot (I don't often miss by much) there's that nice black area with the yellow stripes on it." It's a natural, human reaction, not a sign of adult delinquency—just like it's human to make a withdrawal from the mattress and spend the $ for a good purpose.

Doesn't happen, you say? How 'bout shaking us up a martooni (skip the vermouth) for every touchdown mark on your overrun then? Or, take a look at some of the accompanying photos and, if you're convinced, we'll settle for just one 'tooni — skip the vermouth.

Solution? One wag suggests every NAS build an overrun onto the overrun, followed in six months by an over-over-overrun. We don't think it's practical, 'cause some day the downwind end would come 'round and meet the upwind end, and then the threshold light manufacturers would be out of business.

No, the solution lies in proper interpretation of the end zone purpose by the pilot, *and* in proper maintenance of the runway end or the overrun by the NAS. *Runway lips have caused major accidents.*

When you consider the main wheel diameter of most all high-

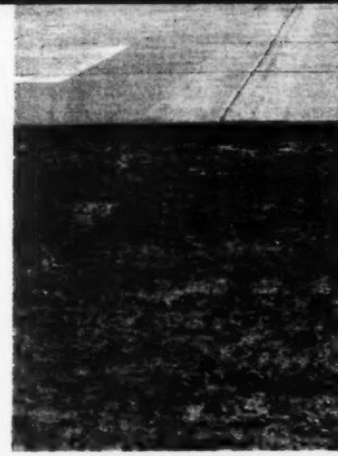
"Two recent accidents highlight the importance of providing runway safety features at the earliest date. . . . . Elimination of lips and shoulders at end of runway and safe overrun areas considered equally important both for overruns and undershoots........". *From ComNavAirLant Dispatch 301712Z July '58*

performance aircraft, you become aware that it doesn't take much of a lip at all to wipe out the gear. And when you consider that a neat, even fill right at the runway end can be washed away to a 4 or 6-inch lip by one afternoon thundershower, you can see why it's imperative that runway ends be inspected at *regular and frequent* intervals—AND GET FIXED!

To tell a pilot, "Caution, runway lip is not repaired" is like rubbing sandpaper on his sunburn. The fact that your station "A" allotment is gone doesn't help him one bit, he's still got an airplane to land safely and deserves a safe place to land it.

BuAer Notice 11132 re-emphasizes the necessity for frequent inspections of runway end zones, and requires immediate corrective action to bring end zones up to standard.

Squadron and NAS Safety Officers can help here by vigorously pursuing, and aiding where possible, the correction of end zone deficiencies. Not at all ridiculous would be the offer of a working party to fix the lip NOW, if manpower is keeping the fix delayed.



This overrun was in fairly good shape once, but a sudden afternoon thundershower can do more damage here than it does to your newly-planted petunia bed.

And pilots — look upon that runway end the same way as you view the round-down on USS BOLTBUCKET; that way, the money is still there in the mattress if you touch down short.

NAS/MCAS CO's — are you satisfied that your Public Works Officer is weighing PW jobs proportionate to their safety value? Is a runway lip going unrepaired because of some No Parking signs or street signs being erected? Granted that there's more work to be done than money or people available to do it, but let's hope that a potential airplane wrecker, the runway lip, is getting more than Lip Service.

BuAer Planning Standards (BuAerInst 11012.1A) calls for a "landing area marker" at least 500' from the threshold, and extending for 530' in the direction of landing. Aiming for touchdown in this area would provide a margin for safety—the other margin would be proper maintenance of the runway lip—some pilots aim pretty low!

"Get rid of that chute!"

Contributed by HU-2
NAS Lakehurst, N. J.

Some helicopter rescue attempts at sea have been unsuccessful due to streamed parachutes which the downed pilots were unable to remove. These accidents attest to a need for more specific information regarding certain phases of helicopter rescues that greatly affect the success or failure of the rescue attempt. A most severe complicating factor that is introduced into any rescue mission is the parachute when attached to the rescuee. When deployed, the parachute presents an added complicating factor of such magnitude that any attempt to pursue the rescue is done at great personal risk to the rescuee, the helicopter's pilot and the crewman.

THE parachute, in its natural element, is unquestionably the best life saving device yet devised. The proper element for the parachute is naturally the sky. But take the parachute out of its natural element and place it in an unnatural element, such as the ocean, and its life saving qualities rapidly depreciate to zero. In the water the parachute strapped to the back of a downed pilot can spell disaster.

The majority of all rescues effected at sea are by helicopters who by virtue of a speed advantage over surface craft are the first on the scene. The helicopter can rapidly reach a man in the water—but its effectiveness as a rescue device and its ability to successfully complete the rescue is largely dependent on the pilot in the water.

It can positively effect a rescue if the rescuee is capable of helping himself into the sling or seat. This requires moderate sea conditions, an uninjured pilot not dazed or in a state of shock and a lack of complicating factors, such as a parachute, or bulky flight or survival gear which prevent sling entry. (The advent of integrated harness and automatic opening parachute warrant additional preventive attention both from operating and design levels.)

The major complicating factor introduced to the helicopter rescue is the parachute when attached to the downed pilot. If the pilot is mobile all efforts should be expended to get rid of the chute before sling entry.

When the pilot is immobile and is therefore unable to rid himself of the chute, the helicopter pilot must make an on the spot decision of whether to send his

crewman into the water to conduct an immobile rescue.

An immobile rescue is an emergency procedure. Sending the crewman into the water is hazardous to the crewman in moderate or heavy seas. He is in the water on a slack hoist cable.

In more than moderate seas, the helo crewman is taking the water in his face regularly, he is in relative motion with the rescuee and thus has a moving target and very difficult physical manipulations to make in order to get a limp or frantic rescuee out of a parachute harness and/or into the rescue sling or seat once he is able to reach him.

When the rescuee is in the water with an opened parachute, the most extreme complication exists, for then the possibility of entanglement of the pilot, the parachute, the rescue sling, and the helicopter crewman in the water is very high.

The helicopter rotor wash will billow the chute and further accentuate the possibility of ensnarlment, will reduce the possibility that the helicopter crewman can obtain a grasp on the rescuee, will exert large forces on the person attached to the chute and will create a good possibility of loss of the helicopter either by the chute billowing into the rotors or by the imposition upon the helicopter of high moments causing uncontrollable tipping accelerations.

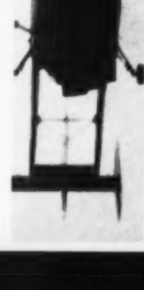
The desirability or ability to lift the parachute and the entangled personnel clear of the water is questionable due to low excess power available under high density-altitude and low wind conditions and because once clear of the water, the billowing parachute may cause damaging physical forces on the ensnarled personnel and/or uncontrollable forces on the helicopter.

The control problem of the helicopter is large. It cannot operate with facility in high winds or high turbulence, or light wind conditions in a hot humid atmosphere. The control problem coupled with poor downward visibility and lack of other fixed reference points require the pilot to be largely dependent upon relayed instructions from the crewman to maintain a position over an object in the water. He cannot thus be said to be in positive visual control of the rescue.

When the crewman is put into the water, the pilot is further handicapped due to the fact that he must pay out slack cable and move back to observe the rescue operation. This results in the pilot being unable to provide direct lift support to the two people in the water. Both hands and feet and much muscle power are required for control. If the pilot's hoist control button fails, he cannot hoist manually or cut a fouled cable.

The success or failure of a helicopter rescue is largely controlled by the parachute. DON'T COMPLICATE MATTERS—GET RID OF THAT CHUTE. As separate life saving devices, the parachute and helicopter have no equals. Mix them and you produce a deadly combination.

While not altogether current, HELICOPTER RESCUE SENSE (NavAer 00-880Q-42) discusses these and other helicopter rescue problems.—Ed.



Although not assigned search and rescue as its primary mission, Marine Aircraft Group (HR) (L)-26 is prepared for the eventuality. To encourage downed rescuees' cooperation, the ABANDON CHUTE sign shown was devised for rapid installation, converting a tactical 'copter into a rescue machine on short notics. Other non-rescue helicopter units are invited to copy.

ANGEL ANGLE

EJECTION from a jet aircraft is not considered by most aviators as a particularly desirable undertaking but more as a necessary means of avoiding the possible dire consequences of such phenomena as flameout, structural failure, or collision with foreign objects.

When a birdman finds himself hurtling through space anxiously awaiting chute deployment, finally achieving successful landing, he looks back upon his experience with a certain degree of mental and emotional upheaval which necessarily attends this type of violent exercise. Eventually he recovers sufficiently to adopt an objective approach to the whole thing and to resume his aviation acitivities with minimum apprehension. After all, he has been the subject of the local NAS conversation for weeks, being constantly called upon to recreate his experience with vivid embellishments for the assembled aghast audience. After basking in the sun of adulation for a lengthy period, he forgets the more distasteful aspects of his experience and confronts no particular psychological block to the continuance of his aviating.

When in the course of human events, however, said aviator is subjected to a similar experience within the short period of one month, he tends to view this flying business with a great deal of skepticism and to engage in some serious introspection as to the

merits of the aviation program in general and certainly as to its safety. He suddenly feels a compelling urge to see his friendly life insurance agent and discuss possible increase in coverage.

I was first confronted with the ejection situation at 20,000 feet over the Jacksonville area. I was carrying out an idle descent approach in my A4D to Cecil Field when I noticed a failure of the engine to respond to power increases above idle setting. In view of unfavorable weather conditions over Cecil Field, I turned to a south heading at 12,000 feet altitude. When assured that I was clear of major population areas, I pulled the face curtain at 5500 feet at 170 knots. My separation and chute deployment were automatic and I landed in the waters of a small inlet. After a battle with my chute which insisted upon dragging me through the water, I separated my harness and inflated my life preserver. Rescue was effected by helicopter. The only physical damage incurred was a set of bruised toes which resulted from my feet striking the instrument panel on ejection. In fact, my left big toe nail had jettisoned all external stores as I left the cockpit.

My second encounter with the art of flying seats occurred in the bombing pattern over GTMO Bay. At the 90-degree position on my run-in, my trusty RPM indicator commenced a frightening rate of descent. As I was only 1300 feet off the deck at 320 knots, I had no time to experiment with relight attempts. I ejected at 2000 feet at 200 knots, after my pull-up. Lest I forget my first ejection, my feet again clobbered the instrument panel with force sufficient to rip my shoelaces off both shoes. (I have subsequently placed an order for a year's supply of Dr. Scholl's foot pads.) When finding myself reasonably intact upon landing, I decided that "Somebody up there loves me" and awaited the arrival of the helo.

Needless to say, two ejections within one month can be considered among the best of hairy tales. But neither could compare with the helicopter rescue following the second bail-out.

As the 'copter hovered above, I climbed into the horse-collar sling and signaled that I was ready to be hoisted aboard. I was lifted only a few feet off the ground when I was subjected to a violent circular swing which dragged me across the deck through various types of foliage including a few trees. I was then surprised by the sudden rapid ascent of the helicopter to approximately 300 feet, as he attempted to lift me above the trees. When I cast an anxious glance downward, it appeared to me that we were at least 3000 feet, above the deck—an impression which was mildly disturbing.

I was then subjected to a series of cable slackenings which made me feel as if the cable were breaking on each occurrence. Much to the enhancement of my mental composure, I noticed that the harness cover had started to rip. This, coupled with periodic jerks of the cable, assured me that I was on the brink of eternity.

While thus meditating on the

imminent prospect of death, I noticed that the helicopter had assumed a precariously unusual attitude which caused my head to be dashed against the side of the helicopter followed by my feet striking on the reverse swing. Fortunately, I was wearing my hard-hat. Continuing to swing violently, I was thrown into a position from which I could see a side view of the helicopter. At times it felt as if my

Continued from preceding page

head missed the rotors by inches. As my harness continued to rip, I became panic-stricken and started screaming at the pilot to let me down. I would walk home gladly. Finally, I was pulled aboard and in my intense fear bent a horizontal bar in the helicopter as I grasped it to pull myself inside.

Ejection was never like this.

Later inquiry revealed that the corpsman operating the rescue rig was inadequately checked-out in its use and that the pilot had to assist him several times during my rescue. The pilot's removing one hand from the controls to aid the corpsman caused the helicopter to lose its hovering equilibrium and to swing in wide arcs until the pilot could restore its stability.

This experience should place renewed emphasis on the necessity for thorough training of helicopter rescue personnel. Decapitation by rotor blade or falling from rescue hoist strike me as particularly inglorious and ignominious ways of dying.

Agreed in this case, but the reported instances of helicopter rescue personnel not doing a good job are very, very rare. Helicopter personnel do sometimes have problems in coping with what equipment is provided them, as well as difficulties with parachutes but this is another topic, and discussed elsewhere in this issue.—Headmouse

TELL GCA TOO

I HAD just completed a flight of about 600 miles in an S2F and was on a GCA final. I had not broken out of the overcast when I was given an emergency waveoff at 200 feet and 1½ miles. The controller stated that a blip appeared on his scope right in front of me which necessitated the waveoff. The waveoff was executed and I pulled back up into the stack with a new approach time 45 minutes away. The next approach was completed without incident.

Upon inquiry after landing, I found that the rescue helicopter had been dispatched to check ceilings at various spots around the field. The helicopter was in contact

with the tower, but *not* with the GCA unit which was bringing in aircraft at minimums of 100 feet and ½ miles.

Two potential hazards were uncovered by this near-miss: (1) The possible collision of two aircraft and (2) The aircraft on final being too low on fuel to permit re-entry and holding for a long period of time.

HIM TO

IMMEDIATELY after raising the gear following takeoff in an F3H–2N, I realized that the "super-hog" was unusually reluctant to accelerate to climb speed. A quick cockpit check assured me that the bird was clean and that the engine was putting out okay.

I continued checking around the cockpit, flaps, speedbrakes, slats, and gear, and about the fifth time around the cockpit I realized that the gear was still indicating down. I had completely misinterpreted the indicator reading and had assumed that the gear was up since I had seen three identical indications.

This of course, was not a hairy experience, but what if I had been putting the gear down and made the same error? Seems to be what happened to our friend in "Whose Wheels?" in your April issue.

Whenever I check my gear these days, I take a good long look at the indicator and don't look away until the rusty brain grasps what the eyes are receiving. No sweat with an SNJ type warning horn.

See Headmouse, March '58 issue.

HUNG UP

WHILE returning from the training area I was practicing some climbs and glides in an HRS-3 when I found I could not reduce my engine below 33 inches and 2400 rpm. The throttle had apparently jammed while climbing. Flight was normal except that in straight and level flight the cruise speed was 90 knots.

I called the tower and told them what occurred and that I might have to make a roll-on landing. They cleared me and I made a pass

at the field to see how slow I could get the HRS-3 to fly. On the first pass the speed was reduced to 55 knots but I had to overspeed the engine to do it. By this time the skipper had arrived in the tower and he advised me to climb to 500 feet then ease my nose up until I was slow enough to start a rate of descent.

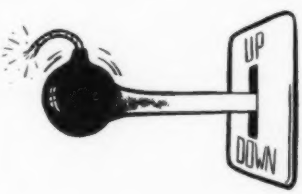
After getting 500 feet I arrived over the approach end of the runway and eased the nose up. As I did the HRS climbed to 650 feet but when it reached that altitude it was slow enough. The rate of descent was started backwards but I picked up a slight amount of forward speed into the wind so I was fairly sure I wouldn't get power settling.

It took the helicopter about 10 minutes to reach the runway. As it touched down I put all four wheels on the ground, had the crew chief cut the mixture and the hop was over.

The standard procedure is to cut the mixture and execute an autorotation if a condition like this exists.—Headmouse

FLAP TRAP

I HAD about 90 hours in the A4D-2 with 9 hours of night in the previous month out of a total of 10 hours. During the evening I had made a series of simulated ASR approaches with the waveoff at about 100 feet, 100 percent, and "gear up."



In the A4D the flaps must come up immediately due to cross-wind effect. After touchdown on my final landing I grabbed a handle but caught myself before I pulled it up. It was the gear handle!

Maybe the on-deck override would not have worked again. I didn't have to find out but I was lucky not to get a scratched bottom and 100 percent pilot error.

FLAP STRAP

ON LANDING rollout in an F9F-8 I reached forward to actuate the canopy control lever. My sleeve

caught the throttle and moved it to the 100 percent position. The sleeve had a strap but it was not fastened.

The aircraft started to gain speed and by the time I realized the cause and retarded the throttle, I had to use extremely heavy braking. In doing so I blew two tires.

Straps are on the sleeve and trouser cuffs for a purpose — use them.

FAM JAM

ON A local fam hop in the R5D landing practice was begun at a local civilian facility. After several full stop landings the Assistant Flight Training Officer (VR) discussed at length with the student the procedure for a loss of engine on takeoff. SOP requires that if the failure occurs before V1, the takeoff shall be aborted; if it occurs after V1 speed is reached, the takeoff shall continue.

At the next takeoff, the copilot (AFTO) called V1 and then pulled back number 2 mixture control. Since V1 had already been called, the takeoff should have continued. The student pulled power off the remaining three good engines. Fortunately, the AFTO re-applied power and a successful takeoff was accomplished.

SIDEARM TRAP

THIS is not an incident but the possibilities of one occurred to me as I was making a JATO takeoff in the A3D to combat a crosswind.

In the A3D the JATO Arm and the JATO Jettison switches are mounted side by side, less than one-eighth inch apart. They are located in such a position as to be barely visible to the pilot under the throttle guard. Their labels cannot be read by the pilot without unstrapping.

To my knowledge it has not yet

happened, but place your bets, it will before long—someone will turn up for takeoff, flip the JATO "Arm" switch . . . and jettison 12 bottles on the runway!

If flap and gear handles have been mistaken, how much more probable in this case!

COLD WEATHER

Over and above the weather education received in the classroom, there are general rules extracted from weather flying experience which will often carry a pilot through difficulties.

About half of the following winter weather safety rules, extracted from a USAF Flight Safety Officer's kit are useful for preflight planning; all of them have been derived from examination of weather circumstances surrounding actual aircraft flights.

KNEE PAD NOTES

Rule 1: For VFR flights under cloud ceilings, calculate clearance over obstructions from sea level heights and not just reported ceiling heights.

Why? Most weather reporting stations are at airports built on level areas considerably below surrounding terrain and obstruction crests. For example, Wiesbaden, Germany is about 500 feet MSL and the nearby Taunus Mountain crest is 3000 feet.

Rule 2: "On top" flights for low ceiling aircraft or without oxygen should not be planned where rain and/or sleet is forecast en route.

Why? Rain and sleet normally occur where cloud tops reach up into the ice crystal zone which is above the freezing level and averages above 12,000 feet where either of these forms of precipitation are falling. Where snow flurries or drizzle is falling, tops may be below 12,000 feet. Where no precipitation is occurring, tops are normally low and cloud layers are thin.

Rule 3: Be certain that sufficient fuel is aboard for flight and alternate considering winds and allowing for 25 percent stronger winds than forecast.

Why? The 25 percent leeway is to allow for forecast error and for zig-zag course that results from wind variations en route.

Rule 4: (Where practical) Choose alternate airports on the lee side of nearby terrain.

Why? Down slope winds warm adiabatically causing evaporation of clouds and reduced precipitation resulting in favorable ceilings and visibility.

Rule 5: Where *dew points* en route are reported below 32° F at surface stations under clouds where rain and/or sleet is occurring or forecast to occur; do not file VFR to avoid IFR in icing conditions above.

Why? When rain strikes metal airplane surfaces in cold dry air, evaporation cools the wing rapidly and severe clear icing may occur quickly.

Rule 6: Where snow is forecast or listed as a possibility at destination, select an alternate where snow is definitely not expected and proceed to it without delay if destination goes below minimums in snow.

Why? When snow reduces visibility to below minimums, it also reduces the radar capabilities of GCA (especially wet snow) by blurring the scopes, it lowers the ceiling by obscuration, icing may be encountered and snow static interferes with radio reception. Snow intensity is difficult to forecast and heavy snow often persists for a long period of time.

Rule 7: Where IFR flight altitude is to be below the height of terrain within 100 miles of course, check flight altitude winds closely and cancel flight if winds are excessive. (Over one-third of the airspeed.)

Why? Strong winds over high terrain and through mountain passes produce turbulence, icing, and great variations in velocity. Large drift corrections added to these hazards make navigation a very difficult task. Lost aircraft may quickly drift into the higher terrain.

Rule 8: Check runway conditions closely and cancel flight where destination has ice coated run-

ways and temperatures are near freezing and/or rain or freezing rain is falling. Also cancel flight plan if fresh wet snow is on the runway or forecast to be on the runway.

Why? Ice and snow on runways are dangerous for landings and takeoffs. Snow is particularly slippery when temperatures are near freezing; wet snow on the runways offers little friction. Ice is always slick; and when it is wet with rain, it offers practically no friction.

Rule 9: When first suspecting that you may be lost, attempt orientation in such a way that wind drift will not carry the aircraft into terrain or other obstruction that extends above your altitude.

Why? Strong upper winds are usually a factor in causing aircraft to become lost. The first precaution upon becoming lost must be to avoid obstructions.

Rule 10: Where weather at destination is reported below minimums in winter, proceed to alternate without delay.

Why? In winter the sun's heating is far less than in summer and often weather deterioration and then persistence of poor conditions occur in the daytime.

Rule 11: Upon receiving the latest weather at destination, further evaluate the height of ceiling reports by checking the temperature and dew point spread. Ceilings that have a spread of one degree for each 250 feet of ceiling may be trusted, but doubt that ceiling will hold where the spread is insufficient. Be completely prepared to proceed to an alternate where the spread indicates a possible below minimum condition.

Why? A difference between temperature and dew point lapse rate in the mixing air causes 100 percent relative humidity at an altitude of about 280 feet for each degree spread. Clouds evaporate below that supporting altitude.

Rule 12: At night where the runway lights are visible, but appear fuzzy and/or the visibility is reported below minimums in ground fog, proceed to alternate without attempting to land.

Why? One-sixteenth of a mile is 330 feet. While lights may be vertically visible through several hundred feet of dense fog, when landing in such fog, the pilot lowers the plane to near tree top level and then the runway is suddenly obscured. At this low level an accident often occurs before pilots can recover from lower setting and airspeed.

Rule 13: When in regions of suspected icing, during climbing or letting down and upon landing, keep a safe margin of airspeed and keep a minimum of extra exposed surfaces, such as wheels and flaps.

Why? Ice accumulation reduces dynamic lift and thus increases stalling speed. Extra exposed surfaces add to the amount of ice accumulation.

Rule 14: Expect heavy icing when letting down into stratocumulus clouds in CP air especially where rain and snow showers mixed are reported at surface stations, and/or where freezing drizzle is reported at high level reporting stations that penetrate up into cloud deck such as Fulda, Germany.

Why? CP air, especially in the spring, is very unstable; thus stratocumulus clouds often consist of dense supercooled water droplets. On letdowns from the clear cold air on top, the supercooled water droplets strike the cold metal and heavy icing occurs rapidly. The freezing drizzle at high level station is an indication that the supercooled water droplets do exist for a given situation.

When flying in the vicinity of rough terrain understand these associations of weather phenomena. For example, when you have any one phenomena of a group, you'll probably also have, or get, the others.

Group I

Calm or very light upper winds
Scattered clouds or clear sky
Little turbulence
Little or no icing
Good radio reception
Simple navigation

Group II

Strong wind flow
Dense cloudiness
Heavy turbulence
Much icing
Poor radio reception
Very difficult navigation

headmouse

Have a problem, or a question?
Send it to HEADMOUSE—he'll do his best to help.

JetCal Test

Dear Headmouse:

Using a jet-cal tester on the tail-pipe temperature circuit during turn-up requires some study and publicized info.

On a dual indicator system with tabbing box installed in the front cockpit, I think the rear cockpit indicator should be *disconnected* or the jet-cal reading will be wrong. (low)

Am I correct??

C. V. PARKER, AEC
JTTU
NAS, Olathe, Kansas

► The information you request is contained in NavAer 17-15A-503, Handbook of Operations and Service Instructions.

Tests conducted by O&R, Norfolk, indicate rear instrument disconnect is unnecessary.

For additional information you may wish to contact the Mfr.'s Tech Rep.—write B&H Instrument Co., Fort Worth, Texas.

For related info published in APPROACH see "TPT Tells the Tale," Nov. '55 and "Tune-Ups Cut Write-Ups," Sep. '58.

Very resp'y
Headmouse

Fizzle-Out

Dear Headmouse:

Talking to a test pilot, I found he had an ingenious device on his mae west that automatically inflated it after approximately two seconds in the water. A seltzer tablet in the device creates a pressure and sends a plunger against the CO_2 cartridge, activating handle and inflates the mae west.

Has the Navy done any investigating or experimenting with this type of device? It appears to be a fine safety feature for high flying attack and fighter boys who could get hurt before, during or after bailout.

ANYMOUSE

► BuAer and Aero Equipment Lab have investigated such devices and, while they haven't given up on the idea, there are apparently some reservations about them. While it's true that an unconscious person would benefit from having his life jacket inflated upon entering the water via parachute, persons who wind up in the water in an inverted cockpit could be in serious trouble after their life jacket inflated automatically. Then too, to make the tablet fizzle in water it must be exposed to the air under normal conditions—and have you ever tried to make a seltzer tablet fizzle after exposure to a few humid days?

Very resp'y
Headmouse

Gyro Trouble

Dear Headmouse:

The August issue of APPROACH has just reached us, and in Colonel Well's article on pages 46 & 47 appears this very intriguing statement:

"3. An instrument susceptible to frequent misreading. An example of this is the 3-inch attitude gyro which has proved to be a killer."

This prompted a quick check on the gyro-horizons installed on our P2V-5Fs (which seem to be fairly standard in Navy multi-fan types). Results: moving indicator (horizon bar) diameter 2¼"; Total instrument visible to pilot, 2¾". While the multi-pilot P2V is pretty hard to drive into the deck with halfway alert cockpit personnel 12 hours of all-weather night low-level operations can sure make a person tired, if not cross-eyed, from trying to decipher the reading on these instruments, and fatigue has probably gotten *Neptune* pilots into more than one hairy situation.

After having seen the *large* (6" or 8") instruments installed in some USAF multi-fan types, perhaps some sort of evaluation of the various merits involved might be well worth the effort expended in making the evaluation.

NEPTUNE PILOT

► It has been recognized for some time that a five-inch gyro instrument is preferable to the smaller ones used on older aircraft. With very few exceptions the five-inch instrument is being installed in new aircraft. The three-inch instrument however, has undergone many refinements including a two tone background, larger and clearer numerals and generally the instrument is more readable. To further improve readability of cockpit instruments considerable attention is being given the problem of lighting and instrument grouping. Instruments with 8-inch faces are unknown to BuAer and the need for such is questionable.

New patrol aircraft are currently configured for larger and more readable instruments. However, no retrofit of a larger attitude gyro instrument is contemplated for the P2V-5F.

Very resp'y
Headmouse

By the Numbers

Dear Headmouse:

. . . The "random counter" seems like an excellent idea but it will probably take considerable time before every aircraft has one.

In the meantime why not paint a set of numbers (any old numbers) instead of wheels on the gear indicators we presently have. Although the numbers would not change, unless a pilot flew the same aircraft every day, the effect would

be the same as that gained from the random counter system.

This squadron has painted one indicator with very little effort and has it flying. At present a letter is being sent to the controlling custodian for authority to do the same with the rest of them. The tower at the home field will then be instructed to listen for and receive three numbers from each of our landing aircraft. The pilot will have to see a down and locked indication to obtain the numbers. This may not prevent all wheels up landings but will ensure that some time during the approach the wheels were indicating down and locked.

VA SAFETY OFFICER

► This idea appears to be in line with the thinking of others. BuAer has ordered 100 of the random pattern counters for evaluation. Delivery of the first is expected 1 April 1959. Current plans call for installation in all aircraft based at MCAAS, Beaufort, S. C. The Air Force has also indicated a desire to buy a large quantity immediately.

Very resp'y
Headmouse

Getting the Word

Dear Headmouse:

How can we be sure that our safety of flight equipment messages get to all the right parties for info and action.

PERS. EQUIP. OFF.

► For a design deficiency, Bureau of Aeronautics (AE) is the right place, and please include NASC on your info list.

Maintenance problems should go to BuAer (MA), and info BuAer (AE) and Aviation Supply Office (SCF-C), as well as NASC.

Where "quality control" is involved, Aviation Supply Office should be the action addressee and BuAer (QC) and NASC should be info. This is to enable Aviation Supply Office to take expeditious action with the manufacturer to determine the background of the "quality control" failure.

AE is Airborne Equipment Division of BuAer. Their basic function is design of equipment. After the design has been accepted, the maintenance of that equipment becomes the responsibility of the MA (Maintenance Division) also BuAer. QC is Quality Control, a relatively new division of BuAer that concerns itself with the inspection of material carried out by BuAer Representatives. The equipment liaison in Aviation Supply Office is the SFC.

Insure that the word is passed to the correct division at the Bureau of Aeronautics and the Aviation Supply Office by correct addressing including info copy to NASC too! And better check the communications and correspondence manuals for proper addressal form.

Very resp'y,
Headmouse

WHIZ QUIZ

1. In cold climates you should wrap your scarf or parka close around your face to avoid frostbite. (True or False)
2. How far are signal mirrors visible to the crews of search planes?
3. In what position should the oral inflation valve on the center compartment of the Mk2 life vest normally be kept?
4. Is the aircraft you are flying equipped with oxygen? If so, has BuAer Aviation Clothing and Survival Equipment Bulletin 20-57, dated 3 July 57, been complied with?
5. (a) What color are the paulins in life rafts?
   (b) What can you use paulins for?
6. What does the mark number of a multi-place life raft indicate?

Answers on Page 48

When assistance was needed the ground people dropped the ball and the flight turned into a

BUM DEAL

IN essence, the report said—"the pilot flew the aircraft into the ground." Now there's no denying that the pilot *did* bash his airplane—but, boy, *you should have seen the help he had!*

Actually he got no help from anybody. Just as soon as he put his name on the DD 175 the carefully prepared procedures designed to help the pilot began fading quicker than a "sure" 50-to-1 bet on the backstretch.

The story began late in the evening as the pilot of a TV-2 got a weather briefing at an inland military base. His destination was near the Gulf coast, which was under the influence of low pressure associated with a quasi-stationary frontal system in the Gulf. There was widespread low cloudiness in connection with this low pressure though all clouds were stratiform with no thunderstorms or buildups.

Forecast for the destination wasn't too bad. It was supposed to be 1000 feet and seven miles by ETA. Besides, GCA was available and requested on the DD 175. "While filing," said the pilot, "a pilot heard me ask the Aerodrome Officer and the desk watch to be sure and have the remarks section passed along. The pilot mentioned to me that the remarks section of the DD 175 was rarely noticed. Upon hearing this I turned and spoke directly to the airman on watch, who would call in the flight plan to Flight Service, and told him to be sure and tell them I wanted GCA. He acknowledged by a nod of the head. We took off from the base at 2220 on an IFR flight plan."

Three minutes after the TV-2 got airborne and boomed off toward the Gulf coast, Flight Service had contacted the destination with the inbound report. Though the service was fast, *there was one omission in the message.*

"I was working as the Air Traffic Control desk watch that evening," recalled an aircontrolman. "I came on duty at 1600 and received the inbound report on the TV-2 from Flight Service. No remarks were forwarded on the inbound. This puzzled me in that the pilot had not requested GCA. I started to ask the person at Flight Service about this but did not as I assumed he knew his job. The tower, approach control and crash crew were notified of the inbound aircraft at approximately 2224."

So failed the pilot's attempts to get his request for GCA passed on. From the evidence it appears that the airman at the departure base carelessly did not forward the request to Flight Service.

Close on the heels of this first error came another, this time at the destination. The ATC desk watch had notified everybody of the TV-2's expected arrival *except* the Operations Duty Officer. Importance of this omission will be seen later.

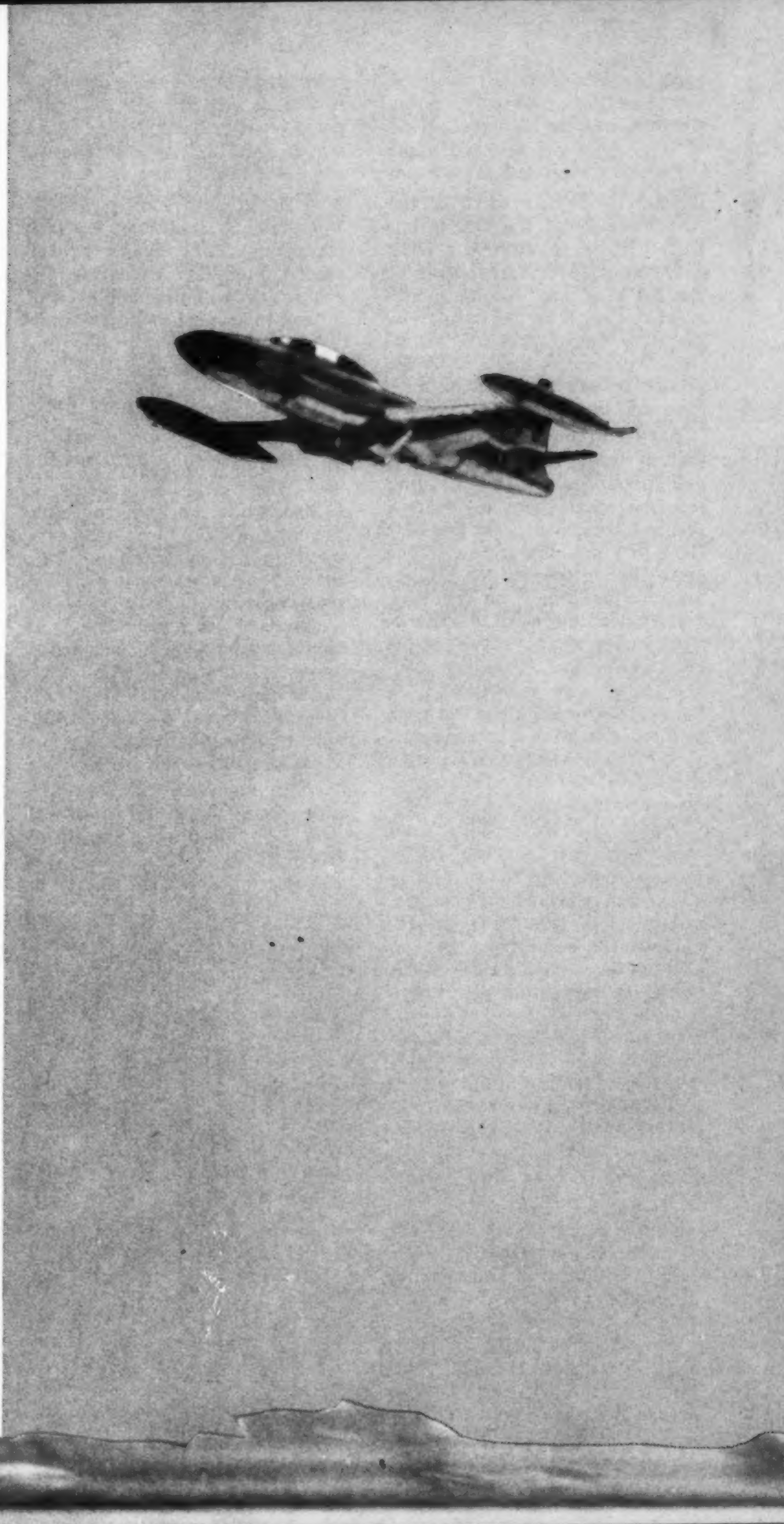
During the time these errors were occurring the TV-2 was reaching for the assigned altitude of 27,000 feet. Sometime during this climb the jet entered the clouds and shortly thereafter the pilot was unable to contact ground facilities. After the pilot in the back seat tried to make contact, the pilot up front tried. "For a period of about 20 minutes I attempted to make contact on various channels," he said. "I don't believe I fully realized that we had no transmitter until after passing my first checkpoint. Since we had been cleared, we continued on our route as planned."

Though the forecast had been for a 1000-foot ceiling at the destination, the field had officially been IFR from early afternoon and the ceiling did not get to 1000 feet until late next morning.

Due to the electronic failure of the ceilometer the aerology observer on duty had to rely on estimation and PiReps for the height of the cloud bases. Answering an aerology request for a ceiling report, the tower said they would have one about 2330, intending to get it from the inbound TV-2.

When the 2300 observation was passed to the tower it was given as 1000 broken, 1200 overcast, 7 miles with very light drizzle. The tower operator questioned the observation "because from the tower it did not appear to be VFR."

A special check observation taken after the accident gave a measured 600-foot overcast, six miles in light drizzle. With such weather the significance of the ATC desk watch's error becomes apparent. *By failing to notify the ODO of the inbound aircraft this local regulation concerning GCA was short circuited.* "When



Continued from preceding page

the field is IFR, it shall be the responsibility of the Operations Duty Officer to alert the GCA duty crew 30 minutes prior to the ETA of any incoming aircraft . . . or, if in the opinion of the duty officer, weather conditions will require that a GCA approach be made, the GCA duty crew will be so notified."

Earlier in the evening the GCA section leader had checked for any inbound aircraft and being informed that there were none, secured the duty crew and left GCA in a standby status. "The crew then proceeded to the operations building," he reported. "After cleaning the GCA office we went to bed at about 2300 in the GCA bunk room. The last member of the crew secured at 2330 and at that time he had not been advised of any inbound aircraft." Unaware of the approaching jet, the Operations Duty Officer had no reason to alert GCA.

While the GCA duty crew were going to bed the ARTC Center advised the tower that the TV-2 was inbound. Some few minutes later the ODO left the operations building. "At approximately 2315 I went to BOQ," he said. "At that time I had not been informed of any inbounds. It was my understanding that there were none." The TV-2 was then ten minutes away from the destination radio fix.

At 2330 the Center called again. "Any reports on this jet?"

"Negative," answered the tower.

"Well, he's unreported in our area. Would you start calling him. See if you can raise him."

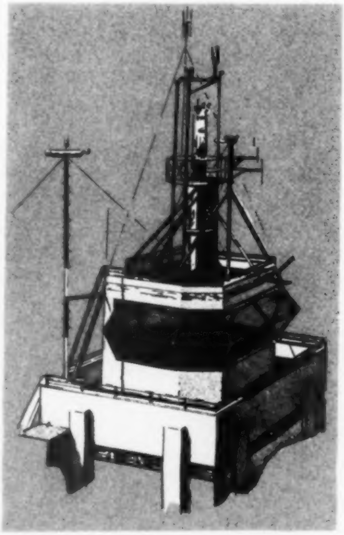
"Roger, will do."

Almost immediately the tower began putting out the call. "Navy jet _____, this is Navy _____ approach control. Come up channel 2 or 5. Report your position." For the next 13 minutes the tape recording reads like a broken record, endlessly repeating the request to "come up channel 2 or 5" and to "report your position."

The possibility that the pilot had lost his transmitter does not seem to have penetrated the fog in the tower. *No weather advisory, clearance for approach, altimeter setting or duty runway was transmitted.*

Meanwhile, back in the cockpit, the TV-2 pilot was commencing his penetration. "We arrived at the beacon at our ETA plus two minutes and commenced a standard jet penetration. At this time the ARC 27 was set on channel 5 and we began to receive transmissions from approach control. We made an effort to transmit but it was obvious that he could not hear us.

"The approach control operator continued, it seemed like every few seconds, requesting our position. My thought during the entire penetration was, 'Why doesn't he give weather information?' We continued our approach and broke out of the clouds and very shortly thereafter I sighted the field."



Once he broke out the pilot attempted to determine the wind direction but could not spot the tetrahedron. He decided to circle the field to the right, enter downwind, and land on runway 19. This decision was made by considering the prevailing southerly winds.

"I had a good beam position," said the pilot, "and made a high power, low rate of descent approach with about 1000 feet of straight away. I was lined up on the center of the runway, took my cut and landed the aircraft with normal touchdown at about 1800 to 2000 feet from the approach end."

Unfortunately the winds were actually from the north at 10 to 15 knots so the jet was making a downwind landing. The accident report says the tower operator was apparently surprised by the appearance of the aircraft. Instead of telling the pilot the landing was downwind and giving the wind velocity, permitting the pilot to use his own judgment, the tower operator's abrupt reaction was to instruct the pilot to waveoff and set up for runway 1, the reciprocal of 19. To compound the confusion the tower requested the pilot to turn his landing light back on if he was "reading" the tower.

Taking the tower instructions at face value the pilot responded with 100 percent rpm on the throttle. By this time the Operations Duty Officer had returned from the BOQ and as he entered Operations he heard a jet take a waveoff. "I asked the ATC desk watch if he knew who it was," said the ODO. "He told me it was

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an IFR inbound that was overdue."

"After takeoff," the pilot commented, "I was going to make an 80- 260-degree low visibility approach and land on runway 1. *While in the left-hand turn, the tower operator called for me to turn on my landing light if I read the tower.* I turned on the light but it destroyed my night vision so I turned it off.

"The tower continued to ask me to turn on my landing light. I reached for the landing light switch but got hold of the head of a bolt. I decided that I did not want the landing light on anyway and put my hand back on the throttle."

Once more the tower transmitted " . . . if you read the tower, turn on your landing light" and once more the pilot tried to comply but his hand reached forward and only grasped the same bolt as before. Then he looked down toward the switch, moved his hand back and flicked the light ON. Unconsciously the pilot allowed the aircraft to climb and he entered the overcast. The rear seat pilot was aware of a tremendous reflection against the clouds.

From the tower came the plaintive call slightly changed, "If you read, turn your lights bright and steady and turn on your landing lights please." However the pilot now had more important things to think about. He pushed the nose over and upon breaking clear, the runway and hangar lights were visible but he realized he must have entered a steep dive without realizing it; there was a 2000 foot rate of descent on the vertical speed indicator. "At 500 feet altitude this is too much," he thought and eased back on the stick. "I remember seeing light colored soil in the beam of my landing light. It seemed to me that we touched down at about 5 degrees nose down, wings level. The last airspeed I saw was 130 knots.

"The next thing I recall was fire to the left side of me . . . then I remember running in mud away from the fire with the other pilot close behind."

Although there seemed to be a lack of ATC attention towards the flight, it apparently was not considered to be a factor in the accident as it was not discussed by the board or the chain of Endorsers.

Approach hopes that this case is as unique as it is classic.—Ed.

FLIGHT VIOLATIONS

TOUCHE?

Things you thought were rules of custom, to be followed by others always and by yourself only when convenient . . . (But which are actually published instructions appearing in OpNavInst 3710.7A):

Pilots *should* wear gloves to protect the hands from flash fires. . .
Unscheduled simulated combat between naval aircraft and aircraft of any other Service or registry *is forbidden*. . .
Except in an emergency, *no* aircraft shall be put into a sharp climb or sharp climbing turn on take-off. . .
Only personnel with current orders to duty involving flying will be permitted in naval aircraft performing acrobatics. . .
Before starting an engine, the wheels of the aircraft *shall* be chocked. . .
When an engine is started by non-pilot personnel for testing or warm-up purposes on aircraft other than VR and VP class multi-engine aircraft equipped with parking brakes, the plane *shall* be tied down. . .
Each person's safety belt and shoulder harness *shall* be worn and tightened prior to takeoff. . .
. . . *under no circumstances* shall aircraft be flown erratically or acrobatically in the vicinity of civil aircraft. . .
Flight personnel *shall* wear identification tags when in flight status. . .
Standard aircraft taxi signals have been adopted . . . instructions for their use appear in Poster NA OO-80ZD-1 . . . all naval activities *are directed* to comply with these instructions . . .

Violations & Accidents

An analysis of accidents involving violations of orders indicates that these violations occur for a variety of reasons. Some violations are willful, others are the result of ignorance of the pertinent rule or regulation. The great majority are the result of inattention or carelessness. . . *OpNavInst 3710.16*

Disposition Vs. Discipline

. . . The Disposition Board is not a disciplinary vehicle and should not be utilized to relieve a commander of his responsibility for taking disciplinary action when such is required. Conversely, disciplinary action should not be involved in the case of a pilot who lacks the necessary coordination and dexterity to safely land a high performance aircraft. . . *OpNavInst 3710.16*

SUGARPOP

APPROACH *extends appreciation to Cdr. F. E. Day, ComNavAirLant Air Intelligence Officer, and Lt. F. J. Dracos, M.C., flight surgeon formerly attached to VRF-31, now with CAG-10, for providing technical material and assistance which made this article possible.*

THE FINE, cool rain, almost a mist that seemed to drift down between the gray windowed walls of San Francisco's buildings, settled on the gaily colored neon signs and the dull black lamp posts, giving them all a glossy, varnished appearance. The quick-stepped noonday crowd filtered past Lt. Smith as he leisurely made his way towards the Federal Building to pick up his transportation orders at 1330. He stopped occasionally here and there to look at the displays and articles that filled the shop windows. Suddenly, the sounds of the cop's shrill whistle, the buzzing street traffic and the staccato footsteps on the pavement were obliterated by the raucous music coming from a loudspeaker horn clamped to the striped awning of Hep's Disc Center . . .

SUGARPOP . . . SUGARPOP . . . SUGARPOP . . .

As he stood there on the Market Street sidewalk and listened to the repetitious beat and sound of the record, Lt. Smith realized that it still had been only weeks since he had been released from the tortures of just such sounds.

There had been not one loudspeaker but two — on opposite corners of the 12′ barbed wire fence which enclosed the compound and separated his crew and him from freedom.

All day long, at 90 decibels, their captors had played "Sugarpop" over and over again, stopping only for "their" national anthem and a gibberish of orders and commands which they read from their military manuals even though they knew the captured airmen could not understand a single word.

As he stood on the busy street

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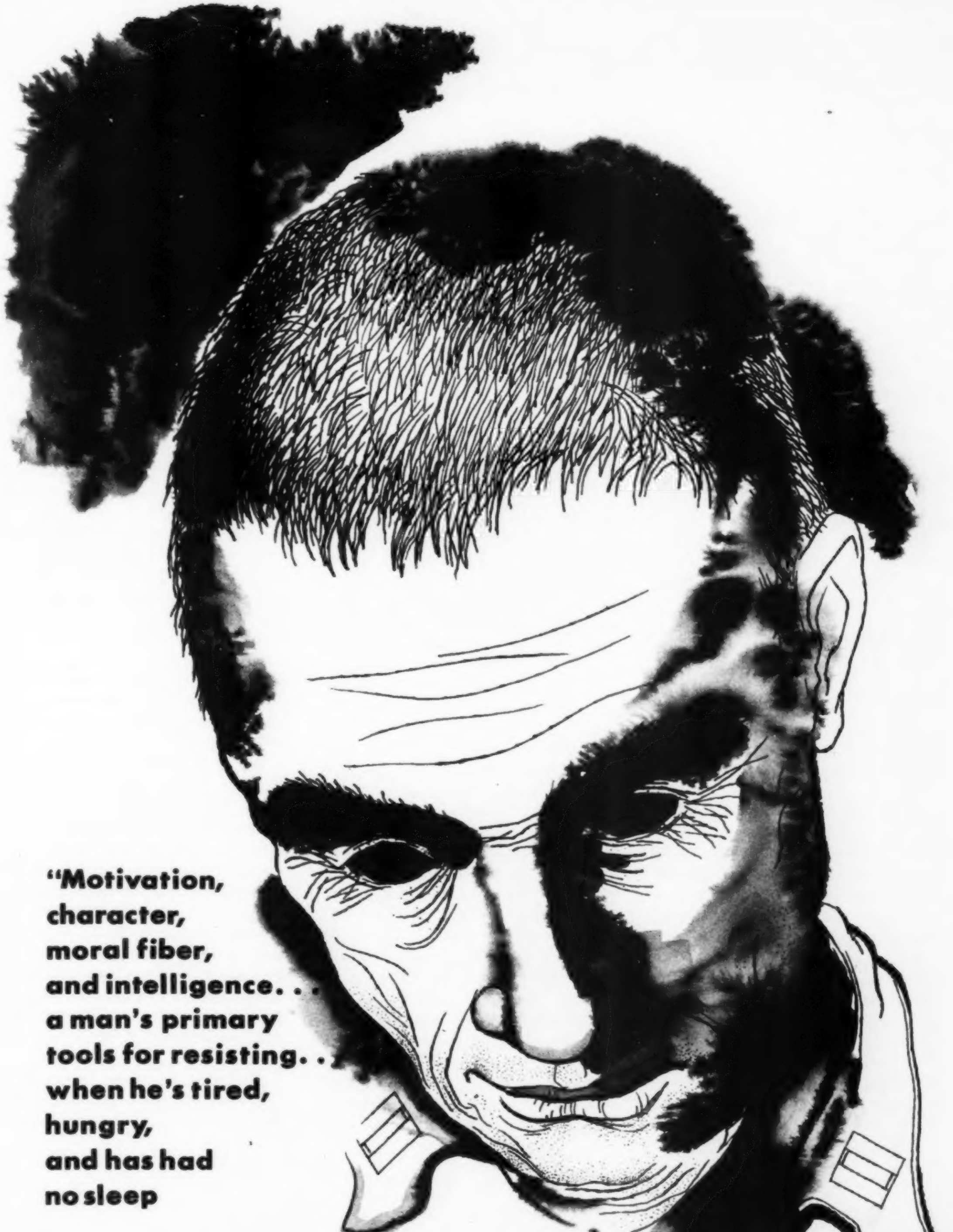


**"Motivation,
character,
moral fiber,
and intelligence. . .
a man's primary
tools for resisting. .
when he's tired,
hungry,
and has had
no sleep**

Continued from preceding page

corner, pictures flashed through Lt. Smith's mind.

Black, inky midnight . . . a double column of tired men roped together at the ankles, led blindfolded into the prison compound . . . grim-faced guards, in strange uniforms, shouting commands, prodding the exhausted prisoners with burp guns, searching them and stripping them of everything but their flight suits, ponchos and shoes.

SUGARPOP . . . SUGARPOP . . . SUGARPOP . . .

Shattering, nerve-tearing, insane noise . . . the artillery barrage fired off to explode the dozing prisoners back to consciousness . . . the blaring of the enemy's national anthem . . . the hammering on top of the wooden boxes into which prisoners were placed for "correction" . . . the screaming din as the guards banged on the sides of metal bins to harass the prisoners shut up inside.

SUGARPOP . . . SUGARPOP . . . SUGARPOP . . .

Even now, weeks later, it seemed incredible that Exercise Tenderfoot had been only a training exercise — five days of escape, evasion and survival and five days in the prison compound. Long before the end, the 50 pilots were reacting and existing as prisoners of war — without thoughts of the beginning when they had stepped, neat, clean and unperturbed, off the bus at the training center or of the end when they would recount their experiences to their squadron mates.

On Market Street the record player at the Disc Center had switched to another tune, but Lt. Smith stood rooted to the spot . . . lost in thought.

How DID it all start?

His mind went back to his selection to fill his squadron's quota for the 10-day course . . . exercise plans and preliminary briefings on what to take and what to expect . . . reporting to the training center with his 49 fellow trainees, some serious, others with the attitude of boys off for a stay at summer camp.

On their arrival at the training area, the pilots were organized into six-man teams, each under the senior officer present. For the five-day survival training period, each team was assigned an experienced guide from the training force. Before the real training exercise began, the guides showed the pilots how to kill a live rabbit, a goat and a snake, and how to dress the meat and smoke it in a smokehouse made of parachute cloth. They built demonstration shelters, made fishnets from string and parachute line, and explained the training center's static displays of snakes and equipment.

Lt. Smith recalled being searched for unauthorized items at the start of the training period. The men were allowed to carry only a poncho, chute cloth and cord, a knife and a pair of extra socks. Among the articles confiscated from the group, he remembered with a rueful smile, were 75 packages of dehydrated soup.

Each pilot was given a live rabbit to take along for food. On the first night of training, the men were permitted to go up into the hills and build campfires as large as they liked. Though this was their chance to kill their rabbits and smoke the meat for easy transport, many of the men chose to carry the animals along live. Some made pets of their rabbits which made it harder to kill them later. Several rabbits escaped.

Lt. Smith chuckled to himself as he remembered the next morning when the men ferried their poncho rafts across the lake into enemy territory. Riding in style high and dry atop one of the rafts, while the builder swam behind and pushed it, were three of the rabbits.

Once the men were in enemy territory, the evasion phase of the exercise began. Using their knives, the pilots hacked their way through thickets and swamp underbrush. Helicopters circled overhead to spot the men and drop propaganda leaflets.

I wonder how many miles we did hike those five days, Lt. Smith thought. He pulled his wallet out and looked at the card he'd been given at the exercise's end — member in good standing of the Order of the Flee.

Some of the men had arrived for the exercise in brand-new heel-blistering boondockers.

Others had worn old shoes which soon developed flapping soles. He, himself, had been one of the few who had had the forethought to wear a pair of paratrooper boots. More than once during the 10 days he had had occasion to congratulate himself, especially at the prison compound when the guards took away the trainees' shoestrings.

You can walk in boondockers without shoestrings, they had explained later at the critique, but you can't escape or run in them.

Most of the traveling in the survival period was done after dark to evade the enemy. While crossing a bridge over part of the swamp, one team walked straight into an aggressor ambush. When the enemy opened "fire" the men scattered and lost nearly all of their equipment. Two of this group were later hospitalized with cases of poison ivy picked up when they crawled through it to escape. A third man dove off the bridge into a foot of water but, miraculously, suffered only very bad bruises.

Lt. Smith's thoughts turned to the men's problems in finding food. On the fourth night, a live goat was staked out to a tree near each team's night camp. The trainees could take it or leave it. Besides a menu of rabbit and goatmeat, there was always fern soup.

The first five days were pretty rough, Lt. Smith thought, but prison camp was rougher . . . captured at midnight — everything seemed to happen at midnight . . . then being marched around blindfolded and hobbled for four hours . . . and all that infernal racket and searching and interrogation.

The men in good physical condition, the ones who had always kept in shape and hadn't overdone the elbow-bending, came through the best. The overweight boys, especially the one who came to the exercise hoping to cut his weight down for his annual physical, had it roughest. He cut his weight down all right, Lt. Smith thought.

And then there was the joker who was stronger than the rest and to prove it did 25 extra pushups in the compound one day. What was it they said at the critique? . . . That this was a foolish display of strength and chances are that in a real situation, he would have been given "special treatment" and would have ended up as haggard and as beat as the weakest.

Depression among the prisoners had been a serious problem with constant interrogation and harassment taking their toll.

Lt. Smith recalled another remark from the critique session:

"Motivation, character, moral fiber and intelligence training are a man's primary tools for resisting when he's faced with a capable interrogator hour after hour after hour . . . when he's tired, hungry and has had no sleep."

More training on the Code of Conduct and the Geneva Convention is in order at the squadron level, Lt. Smith thought. Some of those guys didn't have much idea what was going on. And they ought to know more about prisoner organization. We sure found out the hard way. Group action or things either planned or approved by the group, that's what it takes. You can't afford any arbitrary, foolish individual action in a set-up like that. One of the guys put his finger right on it—You can't go out there and play Mickey Mouse.

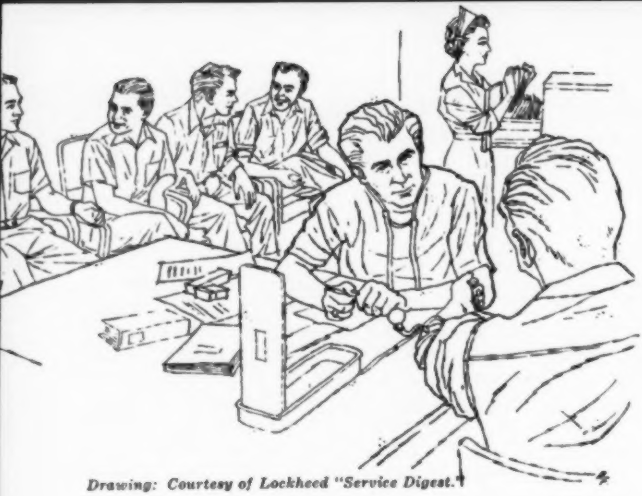
The record player at the Disc Center had by now run through the stack. The machine clicked and once again the loudspeaker blared SUGARPOP . . . SUGARPOP . . . SUGARPOP . . .

With a slight shudder and an expression that made several passersby turn to look back at him, Lt. Smith shook off his thoughts and started on his way again.

As he went into the Federal Building, he had one last thought about Exercise Tenderfoot . . .

The guy who really summed the situation up was that Army captain at the critique who said, "When a pilot is up in his aircraft at subsonic and supersonic speeds, he is the most modern of men, but he never should forget that he is never more than minutes away from the most primitive existence."

To that, Lt. Smith thought, I'll say *amen*. ●



Drawing: Courtesy of Lockheed "Service Digest."

notes from your flight surgeon

Hold That Line

AFTER engine failure in his FJ-3M during Carquals, the pilot ejected. He later stated that when he opened the survival equipment section of the PK-2 kit in the water with the thought of possibly using some of the equipment, he lost it all because it was not tied together.

BuAer Aviation Clothing and Survival Equipment Bulletin 32-57 of 15 Oct 57 requires parachute riggers to attach each item in the PK-2 equipment container with a nylon cord, one end of which is fastened securely to the equipment container.

Hardhat Paint

FLUORESCENT red-orange is not the color to wear when you are doing a Dagwood to a garage-type poker game down the street, when mama says mow the lawn. But for the protective helmet that goes with an aviator's "business suit," you can't beat it.

Helicopter rescue crews and pilots of search planes are high in their praise for the visibility of fluorescent red-orange helmets. Worn by survivors of a recent AJ-2 ditching, the helmets were described by the helicopter rescue crew as looking like red balloons from 1000 feet away at an altitude of 50 feet. The rescue crew pointed out that at the low altitudes from which search and rescue helicopters normally operate, dye marker and yellow life rafts are not seen as easily as from higher altitudes. Fluorescent red-orange hardhats have good visibility qualities from both low and higher altitudes.

(Check "Crossfeed" No. 41 for details on how to get a supply of this paint.—Ed.)

Gesundheit

"A LITTLE nose cold" can be a dangerous thing.

In general, people should not fly with colds, sore throats or tonsilitis.

In an emergency, colds or no colds, the planes go up, but in in ordinary routine operations, grounding personnel with colds is a sensible precaution to protect them from further complications.

Besides a stopped-up nose, runny eyes and the general feeling of not being up to par, the major difficulty experienced by personnel flying with colds is being unable to clear their ears. Especially in descent, this can produce pain, temporary deafness, ringing in the ears and occasionally, vertigo, and if not relieved, possible infection.

Tape Helps

AFTER ditching his F3H-2N, the pilot was picked up by plane guard destroyer. The searchlight operator aboard ship later stated that the red reflective tape on the pilot's helmet, survival knife and mae west flashlight was quite noticeable and definitely helped in locating the pilot and keeping him spotted.

All the pilots in this particular air group installed the reflective tape on their personal safety and survival equipment last year.

Dental Delay

THE reporting flight surgeon in a recent JD-1 accident points out the potential danger of flying too soon after dental work. Although it was not a contributing factor in this case, the pilot in question took off immediately after dental treatment involving the use of a local anesthetic. His mouth and lip were still numb.

Often, the flight surgeon states, it is difficult to predict the degree of discomfort which will be experienced after an anesthetic wears off. Meanwhile, the numbness, which is an unusual and distracting sensation in itself, can seriously affect speech and radio transmission.

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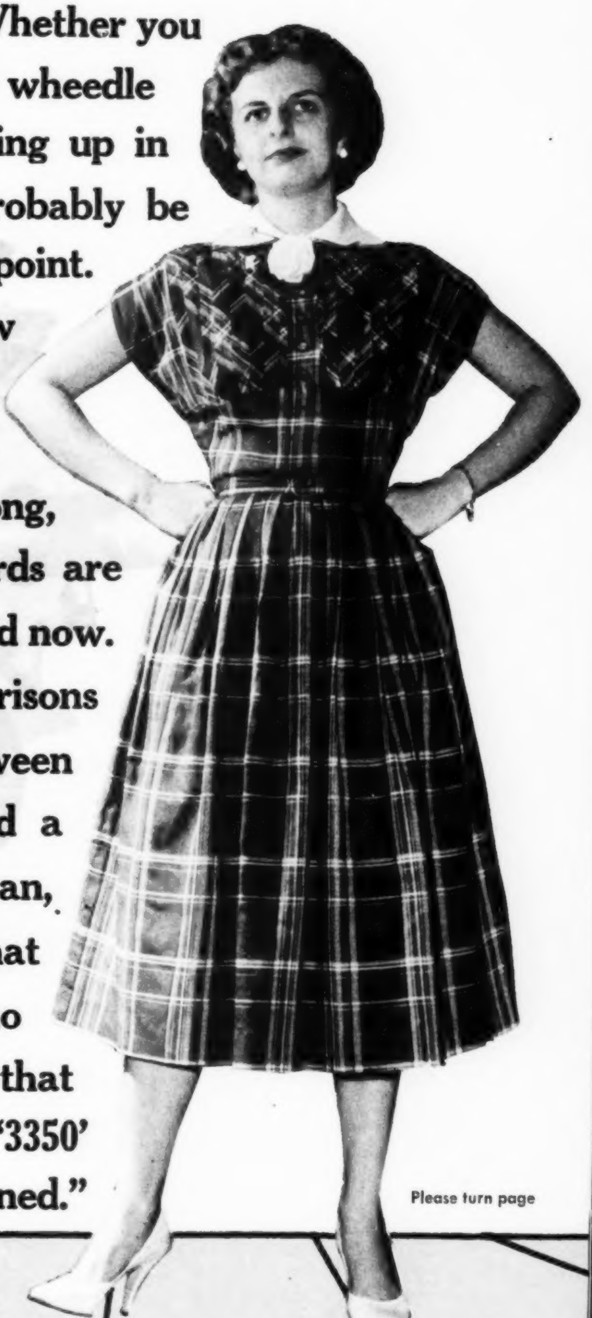
Whether you curse or wheedle the R3350 when it starts acting up in flight will probably be immaterial at that point. If you and your fellow pilots haven't been treating this "baby" like a prima donna right along, no mere words are going to do any good now. Lots of comparisons could be drawn between this engine and a woman, but suffice it to say that "hell hath no fury like that of a '3350' scorned."



Please turn page

by
LCDR DAVE SAUNDERS
Power Plants Officer
Staff, ComNavAirLant

Painting by R. G. Smith. Courtesy of Douglas Aircraft Co.

C'MON, BABY!

Continued from preceding page

We've had problems with the R3350 since its inception. Many of these problems arise from the extraction of so much power from so little weight—highly desirable from a performance standpoint, but ruggedness and durability are bound to suffer.

A study of R3350-26 premature engine removals during the period 1956-57 indicated that 73% were due to factors other than basic engine deficiencies. In other words, 3 out of every 4 of these removals were primarily due to pilot and/or maintenance (including overhaul) errors.

Some improvements continue to be made to the R3350. Unfortunately, money just isn't available to complete all of those desired. On the other hand, the biggest improvements to the dependability of the R3350 are within our capability. Overhaul activities have been revising and reviewing their procedures in an attempt to turn out the best possible product. Considerable progress has been made in the past few months, though it may be some time before it shows up in engine operation. The rest is up to the squadrons. The October 1957 issue of APPROACH told of a Marine squadron which logged 24,000 hours in 2 years without an in-flight engine failure—so it can be done! They attribute their success primarily to strict adherence to established operating and maintenance procedures.

These "established operating and maintenance procedures" are, of course, contained in the flight and engine manuals.

Unfortunately, the people who write these instructions cannot always foresee the problems which face squadron personnel nor can they always approach a subject from the point of view of a pilot or member of an engine crew. Hence, the following notes on the operation of the R3350 have been gathered together over a period of years and it is hoped that they will fill a few gaps and amplify the official handbooks and manuals. Insofar as possible, they are intended to apply to all R3350 engines. However, you may find that there are a

few items which do not apply to your particular model.

Engine Starting

Starts can be expedited and improved by noting the following points:

1. We hate to mention this one again, but hydraulic lock still accounts for a large percentage of R3350 failures. So, after engaging the starter initially, watch the propeller carefully while it makes the required two revolutions for any evidence of stoppage or hesitation which might be caused by a piston running up against a cylinder partially full of liquid fuel.—*Please see box page 42—Ed.*

2. Turn on the ignition prior to energizing the primer switch so that any residual gasoline in the cylinder may burn before more is added. If the pilot forgets to turn on the ignition switch until after he has primed the engine, crank the engine through eight more blades with ignition and primer off to preclude possibility of a hydraulic lock. However, liquid gasoline may still be present in the turbines of compound engines which will be ignited when the first cylinders fire. This results in flame or torching from the turbine exhausts which may continue for a short period even though the engine is allowed to die. This condition is visually alarming but not dangerous as long as the flame source is confined to within the turbine exhaust. Should the pilot deem it necessary to use a fire extinguisher of the CO_2 type for extinguishing the flames, the turbines should be inspected prior to restarting the engine. The thermal shock resulting from impingement of the frozen CO_2 particles upon the hot turbines may seriously damage or warp the blades.

3. Consider the engine conditions before priming to determine the amount of prime necessary. The amount of prime necessary for a good clean start depends upon two factors; the temperature of the air entering the cylinders and the amount of throttle opening. With regard to the first of these factors, the starting of an aircraft engine may be compared to the starting of a car in summer and winter. In summer, a car engine does not need to be choked but does require considerable choking during winter months. Similarly, an aircraft engine which is hot, due to the ambient air temperature or due to having been run recently, will require little priming. Conversely, a cold engine may require steady priming for a smooth start.

The degree of throttle opening, together with the fuel added by priming, determines the fuel/air ratio of the mixture entering the cylinders. It appears that there are numerous throttle settings and degrees of priming which will produce the correct mixture for combustion and a smooth start. If the mixture is much too rich or lean, the engine will fail to fire at all. If the mixture approaches the rich limit of the combustible zone, the engine will fire erratically, emitting black smoke from the exhaust and failing to increase in speed. If the mixture approaches the lean limit of the combustible zone, back-firing may result.

Lean mixtures and backfiring are produced by too wide a throttle opening for the amount of fuel being introduced, or by failure to keep the engine running smoothly on prime until the carburetor takes over. Since lean mixtures burn more slowly than ideal mixtures, the charge in the cylinder may still be burning when the intake valve opens to admit the next charge. The fire then flashes back through the intake pipe and explodes the mixture in the blower, the noise and flame being emitted from the carburetor air intake. Not only

The '3350' powers the P5M (right), the AD (left page) the P2V, WV, R7V and the R4Q—As for horsepower per pound "she's the most,"—but, you've gotta give her the attention you give to a "baby."

Continued from preceding page

is this annoying to all concerned, but it can damage the engine internally and thus should be avoided. In any case, the alternate air door should be cycled subsequent to a backfire and checked for full range of travel. The door should always be in the DIRECT position before starting the engine.

Backfiring during starting can be eliminated in most cases by cracking the throttle only slightly at the beginning of the start and then, after the engine has started to fire, slowly adding throttle until reaching the required throttle opening for the amount of prime being used.

Do not advance the mixture control out of IDLE CUT-OFF until the engine is running smoothly on prime and has attained a speed of 800 rpm or more. The R3350 engine is extremely susceptible to fuel hydraulic lock at lower RPM. If the engine will not attain a speed of 800 rpm on prime alone, a discrepancy exists and should be corrected before proceeding.

Engine Run-up

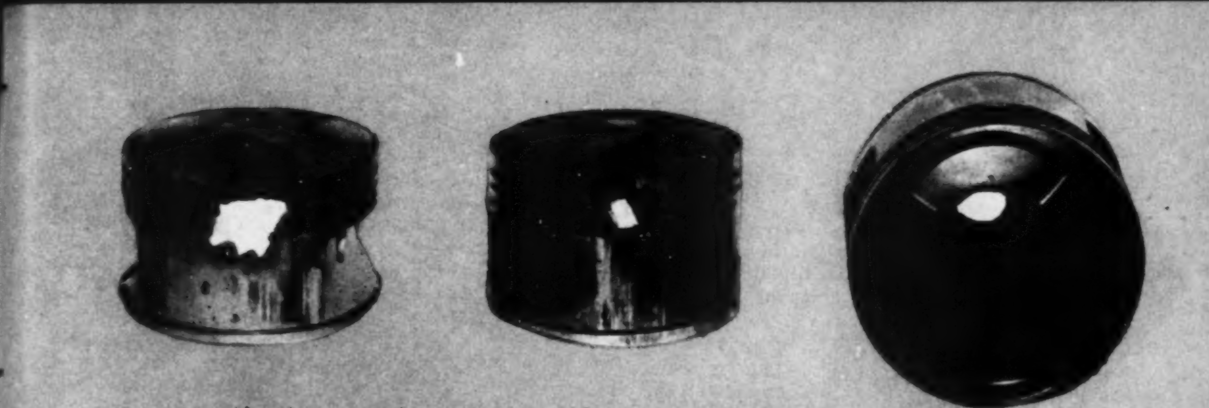
Insofar as possible, make all engine checks with the aircraft facing into the wind. This is of greatest importance when trouble-shooting. Not only does this aid in cooling the engine but effects of tail and crosswinds may produce completely erroneous results for comparative power checks, magneto checks, and idle-mixture checks. A higher RPM for a given power setting may be expected when headed into the wind and vice versa.

Ground cooling of the engine is critical. The heat may be sufficient to destroy ignition leads, seals . . . even though cylinder head temperatures remain within limits. In this regard, engines with propellers stuck in reverse pitch or with cowl flaps stuck in the closed position should be shut down immediately. Never use reverse pitch for backing the airplane.

Power checks are conducted to determine whether or not the engine is developing the required amount of power. Malfunctions which should be disclosed by the results of these checks include dead cylinders, improper mixture, obstructions in the induction system, improper ignition or valve timing, seized bearings, etc.

The power output of a reciprocating engine operating on the ground is indicated in two ways —by RPM and by BMEP (or torque pressure). Manifold pressure is not necessarily an indication of power output but only of the pressure of the mixture entering the cylinders. RPM is an indication of power output only when the propeller control is in full INCREASE RPM position, and the propeller is against the low pitch stops. The propeller will remain against these stops until takeoff RPM is reached. Should the propeller control be moved toward the DECREASE RPM position until the propeller moves out of the low pitch stops and is governor controlled, all true power output indications are lost. If engine power output drops slightly, the propeller would then merely shift to a lower pitch and the RPM would remain constant. For this same reason,

The full power check is usually delayed until the beginning of the takeoff . . .



Detonation and/or a few moments of pre-ignition can cause this.

propeller RPM is of no value in determining power output in flight.

As a general rule, power checks are conducted at manifold pressures corresponding to field barometric pressure and full takeoff power. Under no-wind conditions, the RPM obtained with the manifold pressure set at field barometric pressure should always be the same if the engine is operating properly. A dead cylinder would show up as a reduction of approximately 100 rpm. Unfortunately, in some R3350 installations, the use of field barometric pressure invariably places the propeller in the 2000-2400 rpm restricted range. Power checks of multi-engine installations can be made at 2000 rpm by comparing one engine against the other.

The *full* power check is usually delayed until the beginning of the takeoff. The reason for this has to do with keeping high-power ground time to a minimum and because engines that check out properly at 2000-2400 rpm will develop takeoff power—most of the time. Occasionally, spark plugs which operate well at these RPMs will begin to break down under the higher cylinder pressures produced at takeoff power. This is indicated in aircraft having torquemeters by a definite dropping off of BMEP at the beginning of or during the takeoff roll.

Troubleshooting Engines from the Cockpit

If either the engine or engine instruments are suspected of malfunctioning, the following procedures may point out the source of trouble:

1. Check the MAP gage before starting to see that it indicates field barometric pressure. Make sure the propeller is in full low pitch and that the aircraft is headed directly into the wind.

2. Run engine up to MAP corresponding to field barometric pressure (or alternate setting). Manually adjust the mixture control for "best power" approaching it from the RICH position. "Best power" is indicated by peak RPM and BMEP.

3. If the engine reads low in both RPM and BMEP, trouble other than carburetion is indicated (improper metering of the carburetor has been eliminated by manual adjustment to "best power"). A completely dead cylinder should reduce the BMEP approximately 10 psi and RPM by 50-100. It is doubtful that the pilot would notice any unusual vibration unless more than one cylinder was dead. If the engine reads low in RPM but not in BMEP, or vice versa, one of the instrument indications is faulty. One other remote possibility would be an improper setting of the low pitch stop on the propeller(s). However, this should normally only be considered in the case of a newly-installed propeller.

Backfiring or coughing of the engine in the 650-1400 rpm range may be caused by an idle mixture which is too lean. This condition is also evidenced by a tendency for the engine to cut-out or backfire when the throttle is advanced rapidly. Sparkplug fouling, or a tendency for the engine to die with accompanying black smoke from the exhausts, is indicative of an idle mixture which is too rich. When confronted with any of the above cases, conduct an idle-mixture check as outlined below.

Idle Mixture Check

There has been much comment and argument, particularly among AD pilots, as to the best position for the mixture control during taxiing and ground operation. In this low RPM range, carburetor metering is independent of mixture lever position except when approaching cut-off. The only real danger in manually leaning during ground

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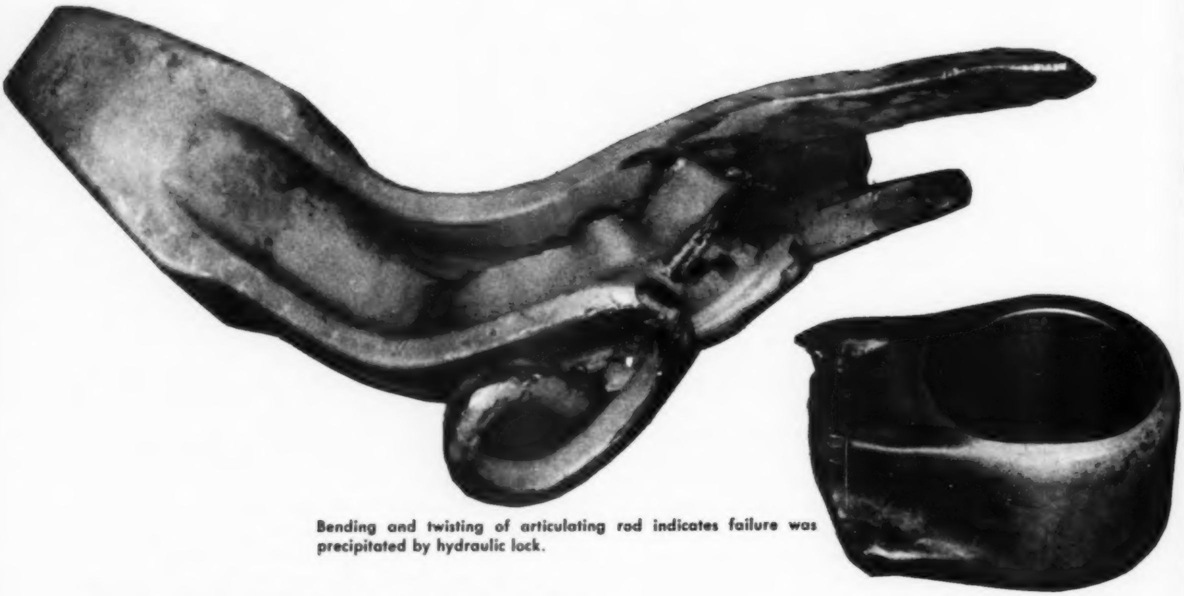


Bending and twisting of articulating rod indicates failure was precipitated by hydraulic lock.

operation lies in forgetting to return the mixture to RICH before engine run-up or takeoff. An engine which satisfactorily passes the following check should not require manual leaning to prevent spark plug fouling.

1. Idle the engine at 650-750 rpm in RICH and lock the throttle.

2. Flick the primer switch momentarily and note any change in RPM. A momentary increase in RPM indicates that the mixture is too lean. If the mixture is either correct or too rich, a momentary decrease in RPM will occur when the primer is energized.

3. To establish whether or not the mixture is too rich, move the mixture control slowly but positively into the cut-off position. If the engine continues to fire for approximately one second without any rise in RPM, or if the rise in RPM does not exceed 10, the mixture is not too rich.

Cold Weather Effects

Numerous flights have been aborted and many engines over-boosted in the past due to a lack of understanding on the part of pilots concerning the effects of cold weather upon the engine and propeller installation. The following information is presented in an effort to prevent a recurrence of this misunderstanding.

In temperatures above 60° F. the R3350 engine can be expected to turn 2850-2900 rpm at full power (without water injection) with the aircraft standing still. As temperatures decrease below this value, the air becomes denser and the engine can't crank the propeller as fast. RPM at full dry power with no movement of the aircraft may drop as low as 2700. On the other hand, cold weather improves the volumetric efficiency of the engines, and power output may easily exceed the limit value of BMEP. Thus, in cold weather and without water injection, the pilot must realize that he cannot ex-

HYDRAULIC LOCK

Eighty-six engine failures directly attributed to articulating rod failures occurred in R3350-26WA engines from 1 January 1957 to 1 July 1958. Thirteen percent of these failures resulted in accidents and forced landings. There were 21 failures on new engines and 65 on overhauled engines. The average accumulated time on the affected engines was 341 hours.

Hydraulic lock was listed on the disassembly and inspection reports as the cause of nearly 55 percent of the rod failures. Moreover, study of the DIR's revealed that 53 of the 86 failures occurred in the number 10, 11, 12, 13 and 14 cylinders. The location (lower cylinders) of the failed rods, which are undetermined or still under investigation, indicates that a large percentage of these could very properly be attributed to hydraulic lock.

pect to get 2900 rpm at the beginning of the takeoff roll and that to exceed the handbook limits of BMEP or manifold pressure is over-boosting the engine and may lead to detonation. The following limits apply to the R3350-30WA and are offered as an example:

265 psi BMEP at 2900 rpm
245 psi BMEP at 2700 rpm

Aircraft not having torquemeters (AD-5 series and earlier) are required to operate at lower manifold pressures on cold days. The amount of reduction can be obtained from the flight manual. Thus, pilots of AD aircraft not having torquemeters must carefully observe manifold pressure limits on colder than standard (60° F.) days. These limits are contained in Section V of the flight manuals and become progressively lower as the temperature decreases. Carburetor air temperature should be used as the governing temperature rather than outside air temperature.

Manual Leaning

It has long since become apparent that carburetors installed on the R3350 engines vary considerably in their metering characteristics. In particular, it has been shown that the NORMAL position of the mixture control does not often provide the 7-12% degree of leanness from "best power" which is desired for cruise. "Best power" has been found to vary anywhere from NORMAL to RICH and even outside those positions in extreme cases. During the winter months, many engines run 1 to 2% lean in the NORMAL position. Since running closer to "best power" than 7% lean is undesirable due to the high temperatures produced and the increased possibility of detonation, resort has been made to manual leaning whenever possible (torquemeter required). Furthermore, comparison of engines in flight with respect to manifold pressure, BMEP, and fuel flow has no significance unless all engines are operating with the same fuel/air ratio (i.e. both leaned the same percentage from "best power").

Manual leaning should never be used above maximum cruise power. It is also obvious that it cannot conveniently be utilized in the cruise power range when rapid power or altitude changes occur, such as in formation flying. In these cases, resort must be made to NORMAL or RICH mixture regardless of the actual metering characteristics.

The actual manual leaning procedure is given in the flight manuals. If, during the leaning process, no "best power" position is noted check to see if "best power" requires more fuel than the carburetor is supplying in the RICH position by returning the mixture control to the RICH position and flicking the primer switch momentarily. If the BMEP drops off, the carburetor is within limits and the leaning procedure may be continued, using RICH as "best power." If the BMEP rises at all, "best power" is richer than the RICH position and no ready reference point is available for manual leaning. In this case, the carburetor is not metering within limits and should be changed.

Torquemeter Fluctuations

Torquemeter fluctuation, otherwise known as the "Nervous Needle," has been one of the most perplexing phenomena associated with the R3350 engine. Although often difficult or impossible to isolate the cause, it may stem from one or all of the following items:

1. Torquemeter system—Air in the lines or improper dampening of the system by the snubber

The powerful R3350 is known to commit hara-kiri when a failure occurs.

Continued from preceding page

may result in erratic BMEP indications. However, this type discrepancy usually occurs throughout the entire BMEP range, and enrichening the mixture has no effect upon it. It can be usually corrected by "bleeding" the line of air and/or replacing the snubber assembly.

2. Carburetion and fuel distribution — With spinner injection engines (AD, P2V), the incoming fuel is discharged through holes in the supercharger impeller and the cylinders obtain mixtures which vary in fuel/air ratio. This is not a desirable condition but is one which the manufacturer has been unable to eliminate entirely. Thus, some cylinders are running richer and some are running leaner than the average. When the carburetor is metering in the NORMAL mixture or manual lean range, some of the cylinders may be so lean that they are developing less power than others and this condition is transmitted to the BMEP gage. In this case, enrichening the mixture will smooth out the fluctuations.

3. Ignition—Some cases of BMEP fluctuation have been traced to components in the ignition system, such as a faulty distributor or spark plugs. Enrichening the mixture generally helps to smooth out fluctuations of this nature also, since a rich mixture may ignite and burn more easily than a lean mixture. Where ignition is suspected, the use of the engine analyzer will generally shorten the trouble-shooting period.

4. Valving—Improper timing or clearance of the valves may cause BMEP fluctuations which will smooth out with mixture enrichment. The only remedy is a complete valve check.

Torquemeter fluctuations are permissible as long as they are of a nonperiodic nature and do not exceed ±10 psi BMEP. Although enrichening the mixture will usually smooth out the fluctuations, do not operate closer to "best power" than 7% lean if at all possible. Should the power fluctuations be of sufficient magnitude to cause noticeable fluctuations of RPM, RICH mixture position can be used until a landing is effected.

Baby Care

No attempt will be made to influence pilots to "baby" their engines when confronted with certain emergency and operational requirements. Where no military necessity is involved, conservative operation will prolong engine life and increase reliability.

The following quote from ATU-402 Safety News Bulletin No. 1-57 concerned the R1820 engine. However, it couldn't be more applicable to the R3350—"Treat your engine(s) better than you would your rich uncle. Abusing a well-off relative might leave you broke, but probably will not age you or interfere with longevity."

For more information concerning engine performance and its effective control, Curtiss-Wright's new handbook, "Trouble Shooting for Optimum Performance," is highly recommended. Ask your tech rep, he'll be more than glad to get a copy for you.—Ed

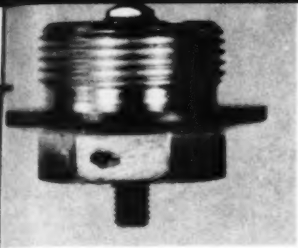
Overboost and Underboost

Inquiries regarding the engine OVERBOOST and UNDERBOOST limits for the R1820/R3350 engines elicit the following comments:

(a) *Engine Overboost Limits*—Existing RPM and MAP limits were established as a result of long and extensive testing. The limits are the maximum allowable, beyond which internal damage to the engine is most probable. It is recommended that the RPM and MAP limits be maintained in accordance with the model engine's Operating Instruction Handbook.

(b) *Engine Underboost Limits*—During descent, use of a low MAP (especially in conjunction with high RPM) for extended periods of time could result in piston ring flutter. To reduce this possibility, high RPM-low MAP combination should be avoided.

It is recommended that the minimum MAP be one inch for each 100 RPM during descent under all operating conditions, with the exception of final approach and landing.



COMING!

CHIP DETECTORS

TWO VA squadrons have recently completed an evaluation of the Lisle magnetic chip detector oil sump plug. The results are good news for the AD drivers in that it was judged to be a positive aid to the pilot in detecting an inflight engine failure.

ComNavAirPac R3350 Engine Bulletin 4-58 which grants permission to NavAirPac squadrons to install this sump plug immediately is quoted in part for information:

"Evaluation of the effectiveness and use of a magnetic chip detector in place of the magnetic plug in the rear sump of the R3350-26WA engines indicates the installation can be of positive help in reducing in-flight engine failures. The plug is so wired that an indicator light suitably mounted in the cockpit glows whenever metallic particles short across the terminals of the detector plug. The detector plug is magnetic so any ferrous metal in the lubricating oil will be picked up and indicate to the pilot that some internal engine discrepancy has probably developed and early landing is desirable. During a recent flight following a loft maneuver mild engine roughness was encountered which cleared up as power was reduced. However, the rear sump metal detector light continued to glow and an immediate landing was executed as a precaution. Metal chips and gear teeth were found in the sump. It is highly probable that had engine operation been continued on the basis that the slight roughness encountered, did not persist, complete engine failure and loss of aircraft could have occurred."

Engine Bulletin 648 directs installation of front and rear magnetic chip detector oil sump plugs. BuAer has assigned aircraft Service Change Number 693 to the sump plug wiring installation which utilizes visual indicator.

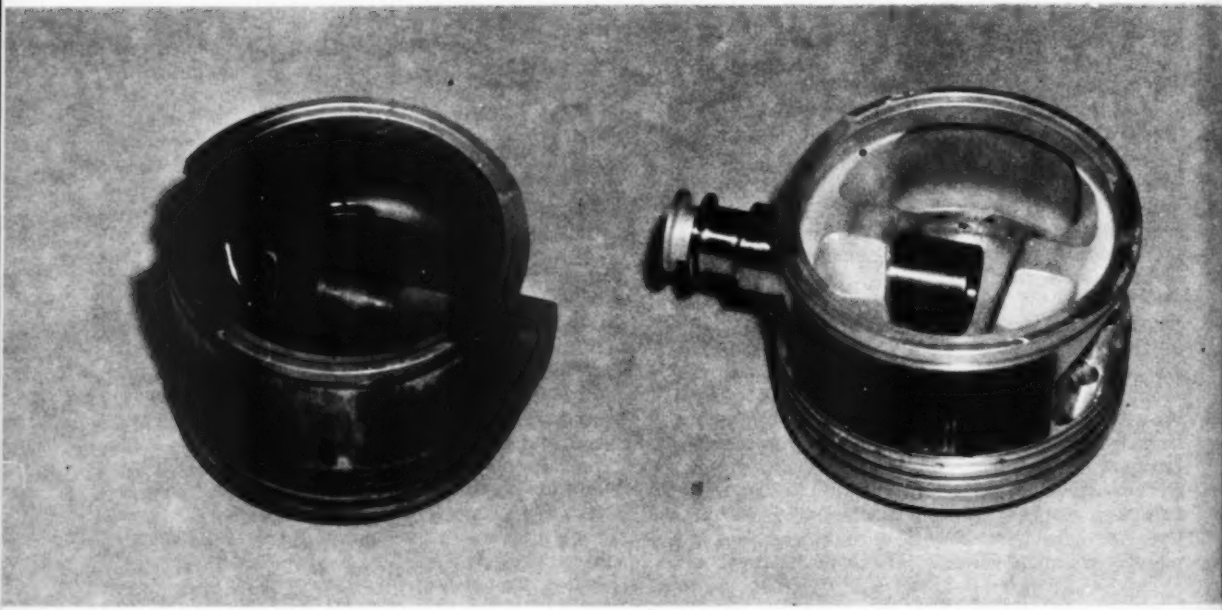
Evaluators point out that the magnetic chip detector sump plug will not cure all in-flight engine failures but it certainly will be a help in that direction. There probably will be occasional false indications on the light requiring abortion of a flight but it is believed that these abortions will not be so frequent as to detract from the value of the plugs. In effect it enables the pilot to keep an eye inside the engine and this improvement alone will add years to AD driver life expectancy in decrease of anxiety. Add even one aircraft "save" to this and the program will more than have paid for itself.

HEED THE WARNING!

NASC dispatch of 30 June concerning an Air Pac chip detector experience is quoted for information: "Recent engine failure indicated magnetic sump plug warning light flickered momentarily and stayed out. Approximately 3 minutes before engine failure the light came ON and stayed ON. All pilots to be indoctrinated this system and instructed to execute a precautionary landing nearest airfield *anytime* a momentary warning light indication is noted."

New type sump plug (top of page) connects to cockpit warning light. When metal chips like those shown on old style plug (left) appear, light comes on ON. Note: Heavy carbonization like condition shown at right can also produce a false warning.

MURPHY'S LAW*



Wrong: Partially inserted piston pin shows plugged end penetrating inner piston boss and how bearingless end is exposed to cylinder wall. Scoring and metal contamination resulted.

Right: New piston and pin with plugged (bearing) end toward outer boss. Positive retention of floating pin occurs when cylinder is installed.

* If an aircraft part can be installed incorrectly, someone will install it that way!

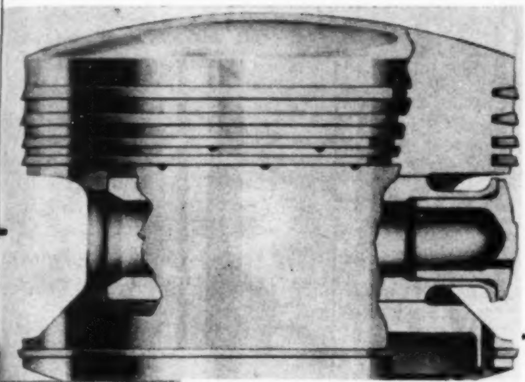


Figure 2-151. Piston configuration

IT'S IN THE BOOK

The piston pin of the R3350 engine can be installed backwards, and was recently, during a jug change on the starboard engine of a P2V. Seven hours later the engine was removed for metal contamination. It was returned to O&R for disassembly and inspection. This process alone costs $8000 for the R3350. This occurrence is but one of several in which the piston pin was installed back-end-to.

It is recommended whenever one is uncertain as to the proper assembly of any aircraft component that reference be made to the applicable instruction before reassembly. And, if an instruction is insufficient or not clear, that a report be made to one's immediate supervisor.

The proper reference in this case is the manual of Service Instructions, R3350, AN-02A-35JL-2. Figures 2-151 and 2-153 which are reproduced here clearly show the proper configuration.

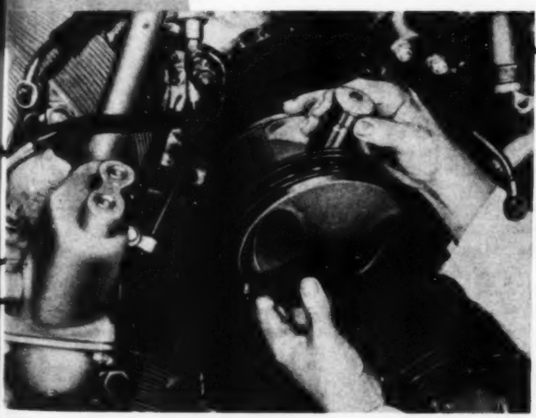


Figure 2-153. Installing piston and pin.

Clipboard

Use Known Points

SEARCH and Rescue Officer once again asked all pilots *not* to use unknown points for references in case of emergencies or crashes. Use points common to everyone, such as towns, airfields, prominent landmarks and the like! e.g. 3 miles east of 4-silo farm or 4 blocks north of Potts farm means nothing to Search and Rescue.—*CNABaTra*

Nosewheel Strut Inflation

ANALYSIS of a recent A4D-2 accident revealed a soft nosewheel strut as a possible cause. The contractor advises that minimum airspeed for nosewheel lift-off increases 4 knots for each degree below normal attitude. Approximately 30 knots additional airspeed is required for nosewheel lift-off with nosewheel strut fully deflated.

Magnetic Compass Deviation

THE CAA has reported that an airline recently experienced a 15-degree magnetic compass deviation when the landing gear was retracted. Investigation by the operator disclosed that the nose gear tire bead wire pile had become magnetized. Further investigation revealed several other tires in the same condition.

In analyzing this problem it was learned that both tires and struts can be magnetized by either lightning discharges or inadvertent coiling of the ground power cable around the strut or tire. This condition can be corrected only by demagnetizing or replacing the offending part.

In view of this it is suggested that every effort be made to keep from placing ground power unit cables on or near nose gear struts and tires.—*FSF Mechanics Bul.*

Need to Know

THE "need to know" principle is a valid one which protects you as well as the classified material that is kept locked up.

Most aviation accident data needs to be known by everyone, for even the "two thirds astern" Navy becomes involved in aviation matters as evidenced by this month's feature article, "Quick Pickup".

When sufficient aviation accident data is gathered under one cover however, it becomes classified information. If you've ever wondered how aircraft accidents are related to fleet readiness, there's your answer, for a fiscal year's accident data is one piece of a jigsaw puzzle that spells out "readiness" when it's all put together.

The Fiscal 1958 issue of the U. S. Navy Aircraft Accident Statistics is classified Confidential—not to keep it out of circulation, but to keep its circulation down to the "need to know" circle.

Commanding Officers, Maintenance Officers, Operations Officers, and many others will find valuable, useful data in this classified publication, if they will convince themselves that its very classification indicates the meaningfulness of its contents. If the AIO has it locked up because he's the one with all the safes, he's not likely to break it out unless someone keenly interested in aviation safety says, "Hey Shadow, let me see what that Annual Summary has to say about our model . . ."

Liquid Cartridge Life

A BUOrd dispatch has established the service life of liquid agent fire extinguisher cartridges at one year, and the shelf life at 2½ years.

ANSWERS to Whiz Quiz page 27.

1. False, your warm breath will condense, frost the inside of your scarf or parka and you'll get just what you're trying to avoid—a frostbitten face. (AFM 160-30, p. 82)
2. A glass signal mirror can be seen as far away as 45 miles from an aircraft at 5000 feet toward the sun from the survivor, if the mirror is used properly. A metal mirror can be seen as far away as 35 miles. Since at these distances the survivor probably would not see the plane and might not hear it, it is a good idea for him to sweep the horizons with his mirror beam from time to time just in case. (NavAer 00-80T-56, p. 4-9)
3. It should be kept unscrewed (open) to permit immediate oral inflation. When you are in the water and have blown up the center compartment of your vest, then screw the valve in to close it. (Survival Manual, p. 7-4)
4. If you don't know what this bulletin is about, go see your parachute rigger or your maintenance officer. Both should have copies.
5. (a) Fluorescent red on one side and sea-blue on the other.
   (b) Paulins can be used for signaling, camouflage, catching rainwater, protection against weather and as a sail. (AC Survival Equip. NavPers 10352, p. 30, 201)
6. Passenger carrying capacity. (NavPers 10352, p. 59, 202) *except in the PK-2.*

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2nd LT R. N. SIMPSON, USMCR

Aircraft: HOK, MHRS-263

After a normal night takeoff Lt. Simpson experienced complete engine failure at 200 feet. To avoid hitting a crash truck directly in his flight path, he made a rapid 90-degree turn and, without the aid of landing lights, made an autorotation to a smooth landing with no further damage or injury. His rapid evaluation of the situation and the professional way in which he handled it prevented serious injury to himself, his copilot, and to members of the crash crew.

LTJG J. L. DIXON

Aircraft: HRS-3, HU-1

While flying at 7500 feet msl over mountainous terrain, Lt(jg) Dixon encountered a severe updraft which caused the HRS-3 to pitch violently upward. Violent gyrations of the cyclic required the combined efforts of both pilots to level the 'copter. The collective bottomed abruptly and auto rotation commenced. A loss of directional control followed, caused by severing of the tail boom. Control boost servos were tested and found to be working normally. Autorotation was continued, and Lt(jg) Dixon made a moderate flare to a landing on a gentle slope at 3200 feet with no further damage to the aircraft.

LTJG G. L. VANDEWATER

Aircraft: FJ-3M

While towing a target banner at about 500 feet in the immediate vicinity of NAAS El Centro, Lt(jg) Vanderwater began to experience engine trouble. The engine seized immediately after he retarded throttle and notified his escort that he was dropping the banner. He nosed over to maintain approximately 150 knots, dropped gear, flaps and speed brakes, and by skillful maneuvering lined up for a landing on runway 26R. Due to his low initial altitude, the gear had not become fully extended; Lt(jg) Vandewater secured all cockpit switches and controls during slideout, and was able to abandon the aircraft as soon as it came to rest. Resultant damage to the aircraft was minor. His skillful handling of the aircraft and his exceptional reaction to the emergency were commended by ComNavAirPac.

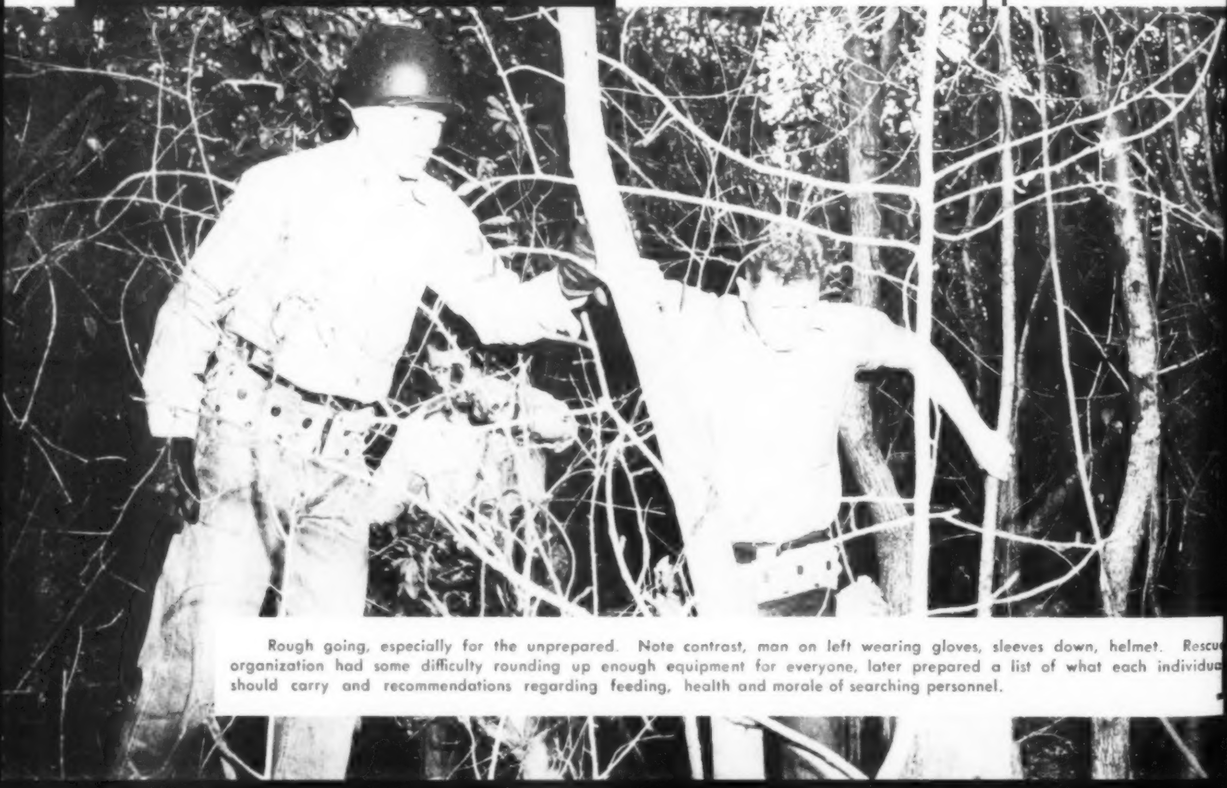
Recognition of heads-up flying is essential to a positive program of flight safety. For this reason Approach will acknowledge certain selected individuals whose exhibited flying ability merits membership in the "Old Pro Club" of naval aviators. Commanding Officers are invited to submit nominations for selection.

Even a little altitude makes an area look deceptively uncluttered and passable. Scene was Bagdad Peninsula, east of Pensacola, Fla. Local citizens cooperated with civil and military searchers admirably—except for an elderly farmer whose tangerine grove tempted hungry searchers.

Search party under way. Coordinating Center kept tabs on parties through use of helicopters and walkie-talkies, was able to direct investigation of leads sighted by search planes. Medical personnel are vital on an operation like this; searchers were subject to fatigue, foot sores, cuts, and snakebite, but rapid evacuation of casualties enabled fuller concentration on search.

MAYDAY!. . .

"My student has bailed out!" And thus began a search which involved over 300 men, several aircraft, helicopters and boats, and four days of intensive searching through swamps, fields, dense thickets and underbrush. Many things learned during this search have now been committed to plans and guides for the benefit of future efforts. Unit aviation safety officers have received the full-length narrative of this search; others may obtain copies by requesting them from the Commander, NASC.



Rough going, especially for the unprepared. Note contrast, man on left wearing gloves, sleeves down, helmet. Rescue organization had some difficulty rounding up enough equipment for everyone, later prepared a list of what each individual should carry and recommendations regarding feeding, health and morale of searching personnel.